WM-R15

SERVICE MANUAL

- **Refer to DR-W70L Service Manual issued previously for information of headphones supplied with WM-R15.**

US Model
Canadian Model
AEP Model
UK Model
E Model

- Photo : white type

'Dolby' and the double-D symbol are the trade marks of Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

SPECIFICATIONS

Recording system	4-track 2-channel stereo
Fast winding time	Approx. 2 min. 30 sec. with Sony C-60 cassette
Frequency response	(DOLBY NR OFF) 50–10,000 Hz 40–15,000 Hz (playback) (with the PB EQ selector set to NORM) 40–15,000 Hz (playback) (with the PB EQ selector set to METAL/CrO_2)
Input	External microphone input (stereo minijack) sensitivity 0.2 mV (–72 dB) for low impedance microphone
Output	Headphones (stereo minijack) load impedance 8–300 ohms
Power output	Headphones: 20 mW + 20 mW (16 ohms) (at 10% harmonic distortion)
Power requirements	3 V dc two batteries, size AA (IEC designation R6) External batteries (used in the optional EBP-500 battery case): two batteries, size D (IEC designation R20) DC IN 3V jack accepts: optional Sony AC-39 ac power adaptor for use on 120V ac, 60Hz (US, Canadian model) optional Sony AC-37 ac power adaptor for use on 220V ac, 50Hz (AEP model) optional Sony AC-37 ac power adaptor for use on 240V ac, 50Hz (UK model) optional Sony AC-38 ac power adaptor for use on 110, 120, 220 or 240V ac, 50/60Hz (E model) optional Sony DCC-70 car battery cord for use on 12V car battery

Tape Transport Mechanism Type	MT-WMR15 (U)-76

Battery life (US, Canadian model)

Batteries	Recording	Playback (headphones)
Supplied Sony SUM-3(NS) New Super batteries or optional Eveready No. 1215 Heavy Duty batteries	Approx. 3.5	Approx. 5
Sony Eveready AM3 alkaline batteries or Eveready No. E91 alkaline batteries	Approx. 7	Approx. 9

(hours)

Battery life (AEP, UK, E model)

Batteries	Recording	Playback (headphones)
Supplied Sony SUM-3(NS) New Super batteries	Approx. 3.5	Approx. 5
Sony Eveready AM3 alkaline batteries	Approx. 7	Approx. 9

(hours)

Dimensions	Approx. 110×83.2×33.2 mm (w/h/d) ($4^3/_8 \times 3^3/_8 \times 1^5/_{16}$ inches) not incl. projecting parts and controls Approx. 113×90.1×34.2 mm (w/h/d) ($4^1/_2 \times 3^5/_8 \times 1^3/_8$ inches) incl. projecting parts and controls
Weight	Approx. 290 g (10.2 oz) incl. batteries not incl. other accessories

MICROFILM

0dB = 0.775V

STEREO CASSETTE-CORDER

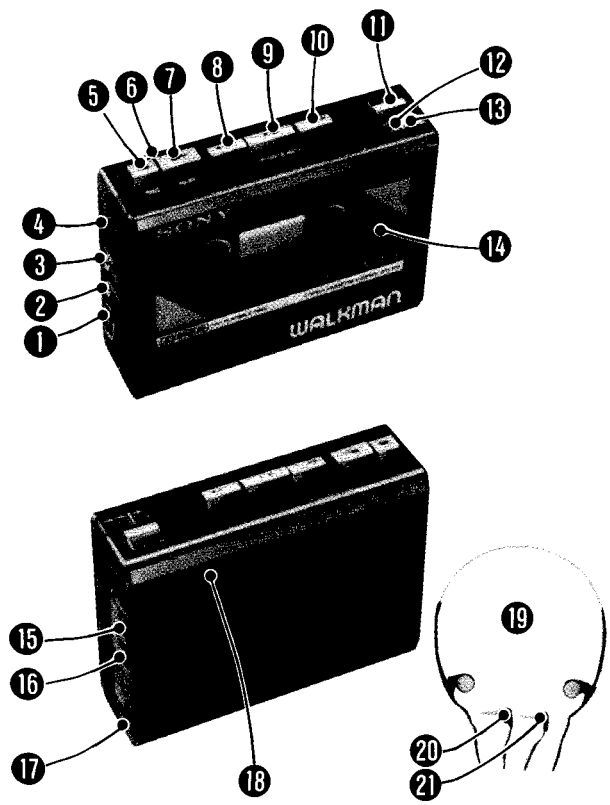
SONY®

TC

FEATURES

- Auto-reverse function changes the tape playback direction without turning the cassette over.
- Dolby NR system reduces tape hiss noise in the playback mode.
- Counter-inertial flywheel system for stable tape speed.
- The supplied headphones, which incorporate a microphone in each headphone unit, enable you to make a binaural recording.
- MIC (PLUG IN POWER) jack supplies power to a pair of microphones incorporated in the headphone units or to an optional ECM-102 electret condenser stereo microphone.

PARTS IDENTIFICATION



❶ VOL (volume) control
❷ PHONES (headphones) jack (stereo minijack)
❸ MIC (microphone) (PLUG IN POWER) jack (stereo minijack)
❹ Tape counter and reset button
❺ ● REC (record) button
❻ II PAUSE switch
❼ ▶ PLAY (playback) button
❽ ◀◀ (fast reverse) button
❾ ■⏏ STOP/EJECT button
❿ ▶▶ (fast forward) button
⓫ DIRECTION button
⓬ REV (reverse) indicator
⓭ FWD/REC (forward/record) indicator
⓮ Cassette holder
⓯ PB EQ (playback equalizer) selector
⓰ DOLBY NR (PB) (playback) switch
⓱ DC IN 3 V (external power input) jack
⓲ Battery compartment (rear)
⓳ Stereo headphones with microphones (supplied)
⓴ Microphone plug (red)
㉑ Headphone plug (green)

SECTION 1
OUTLINE

1-1. SERVICING NOTES

Replacing chip components

All chip components should be connected and disconnected, using a tapered soldering iron [temperature of the iron tip: less than 280°C (536°F)], a pair of tweezers and braided wire.

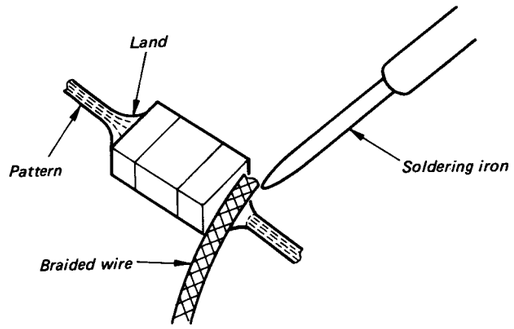
Precautions for replacement

1. **Do not disconnect the chip component forcefully. Otherwise, the pattern may peel off.**
2. **Never re-use a disconnected chip component. Dispose of all old chip components.**
3. **To protect the chip component, heating time for attaching the component should be within 3 seconds.**

○ Removing chip components

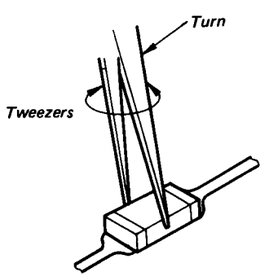
(1) Removing solder at electrode

Remove the solder at the electrode, using a thin braided wire. Do not remove the solder of the part (chip component) attached adjacent to the electrode.



(2) Disconnecting chip components

Turn the tweezers with the soldering iron alternately applied to both electrodes, and the chip component will be disconnected. Take careful precautions while disconnecting, because if the chip component is forcefully removed the land may peel off.
Never re-use a disconnected chip component.



(3) Smoothing the soldered surface

After disconnecting the chip component, remove the solder by using a braided wire to smooth the land surface.

○ Connecting chip components

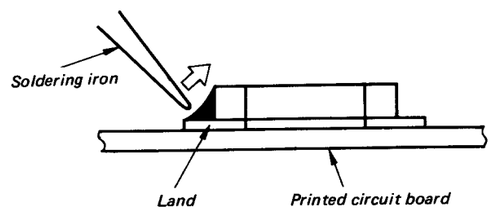
The value of chip components is not displayed on the main body. Take due precautions to avoid mixing new chip components with other ones.

(1) Applying solder to land on one side

Apply a thin layer of solder to the land on one side where the chip component is to be connected. Too much solder may cause bridging.

(2) Speedy soldering

Hold the chip component at the desired position, using tweezers, and apply the soldering iron in the arrow-marked direction. To protect the chip component, heating time should be within 3 seconds.



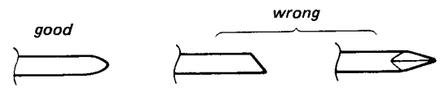
(3) Speedy soldering of electrode on the other side

Solder the electrode on the other side in the same way as in (2) above.

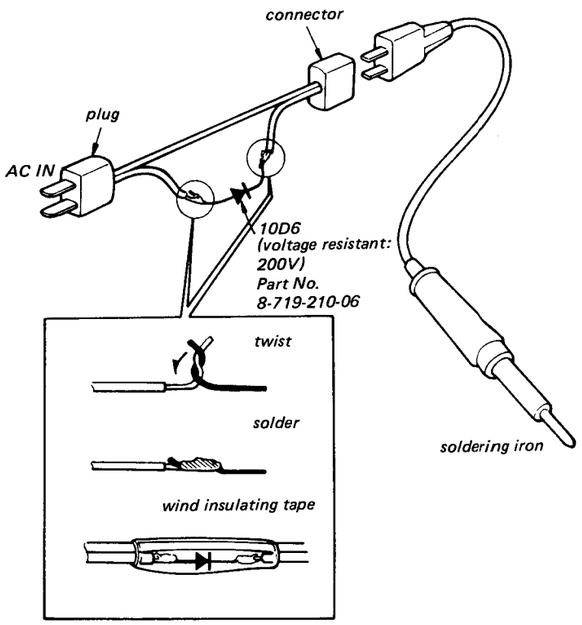
Flexible Circuit Board Repairing

1. Keep the temperature of the soldering iron at 270° ± 10°C during repairing.
   You can maintain the temperature of the soldering iron around 270°C by using the thermal controller as illustrated on the right.
2. Do not touch the soldering iron more than 4 seconds or 4 times on the same conductor of the circuit board.
3. Do not apply force on the conductor when soldering or unsoldering.

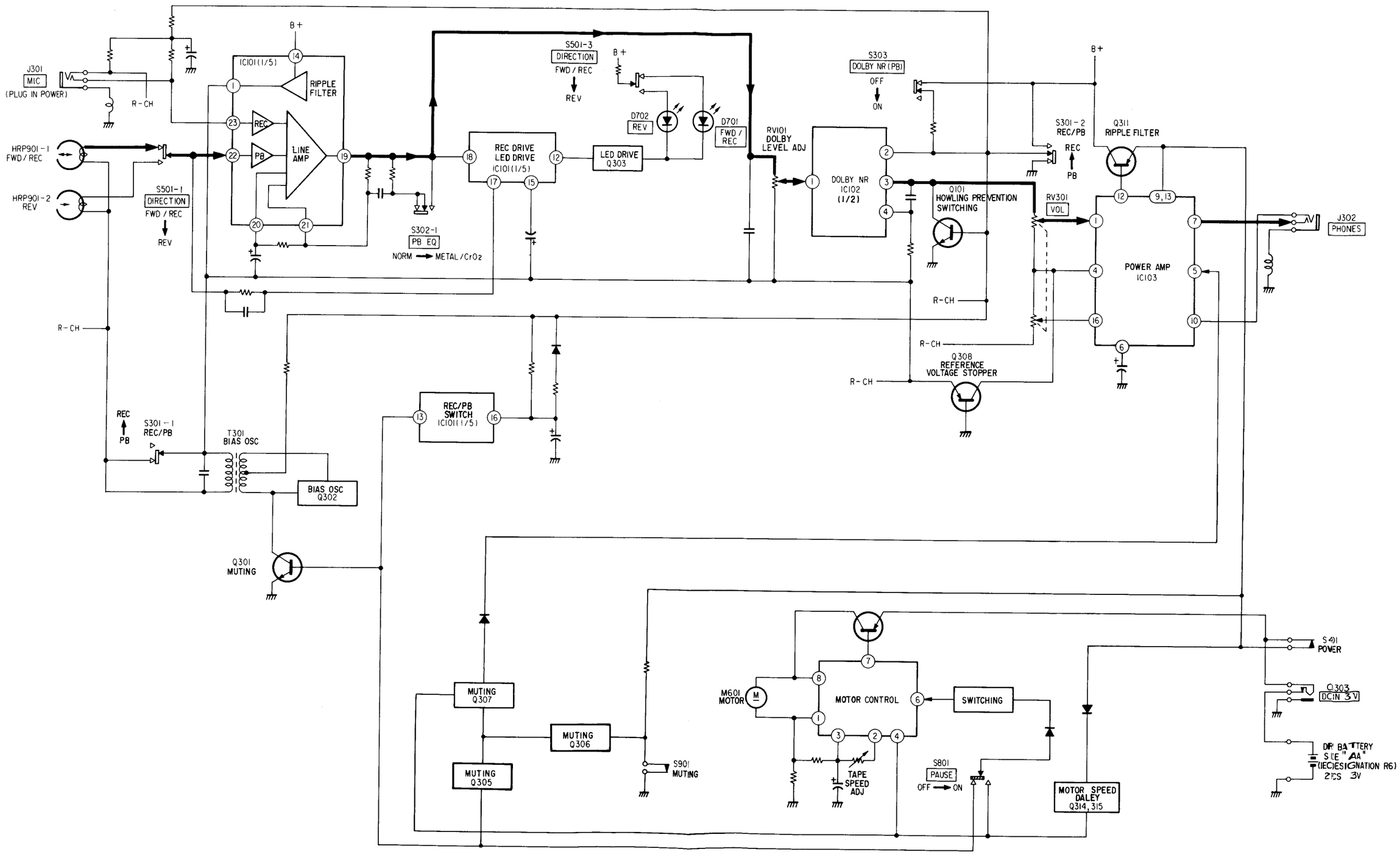
Tip of soldering iron



To make thermal controller of soldering iron



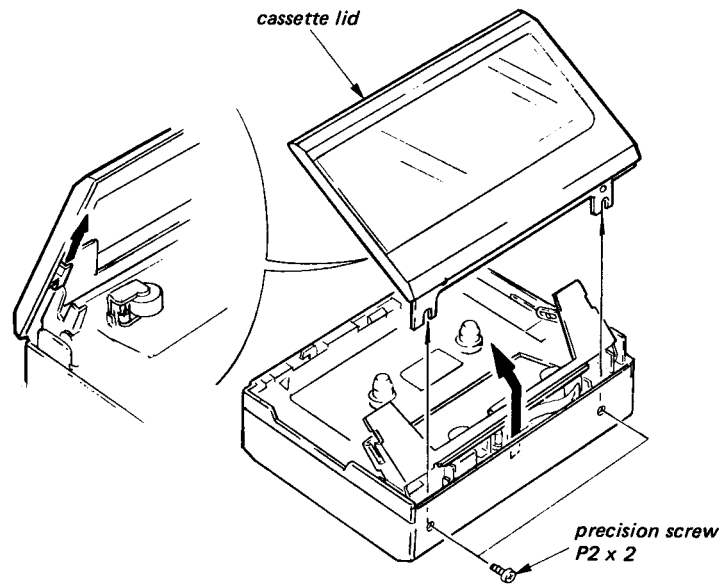
1-2. BLOCK DIAGRAM



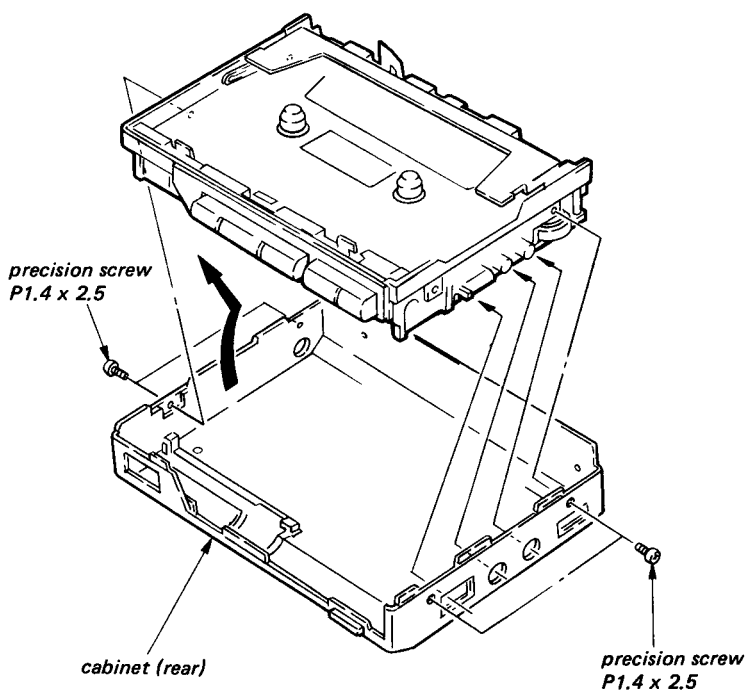
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

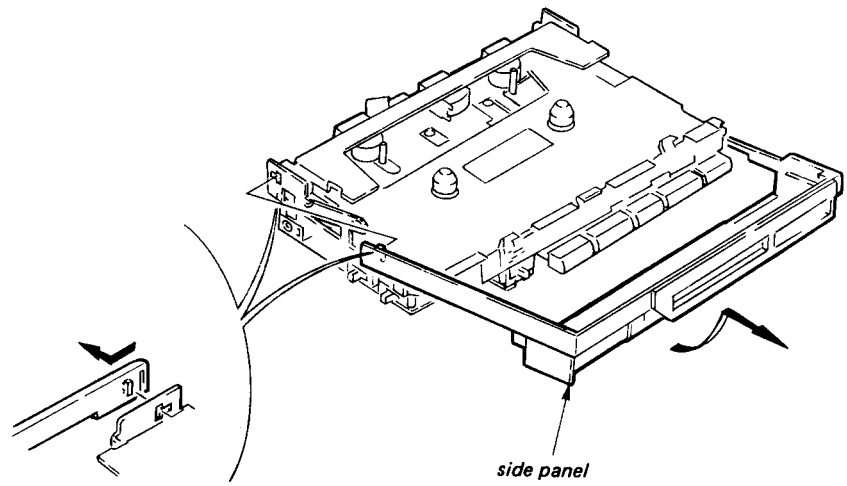
CASSETTE LID



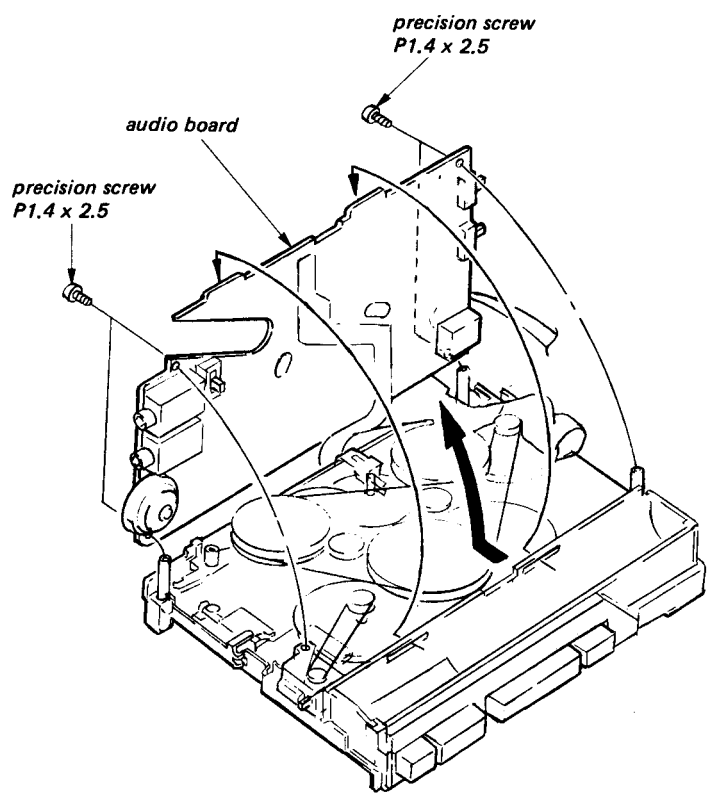
CABINET (REAR)



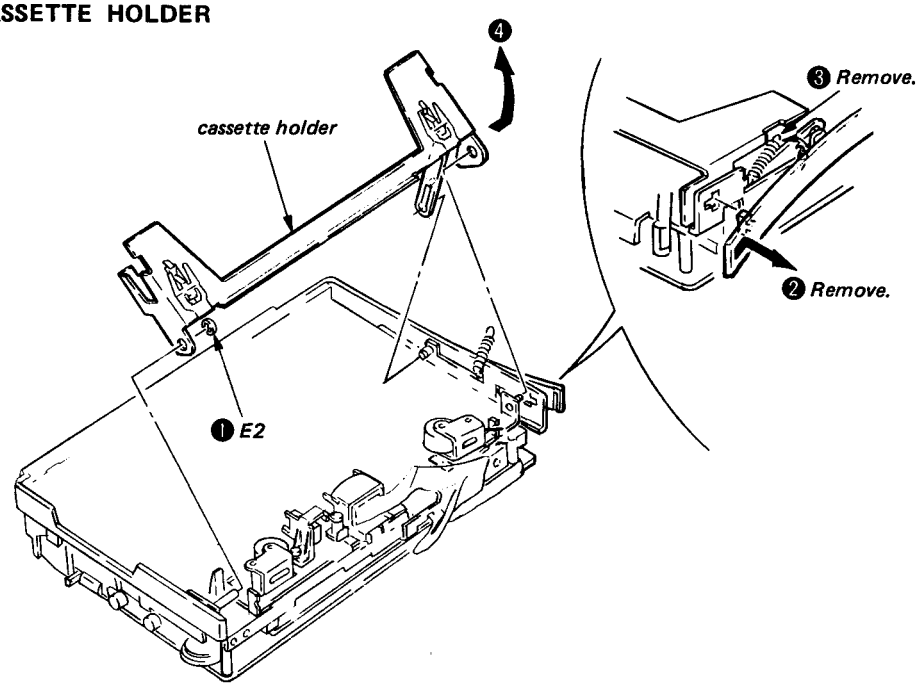
SIDE PANEL



AUDIO BOARD



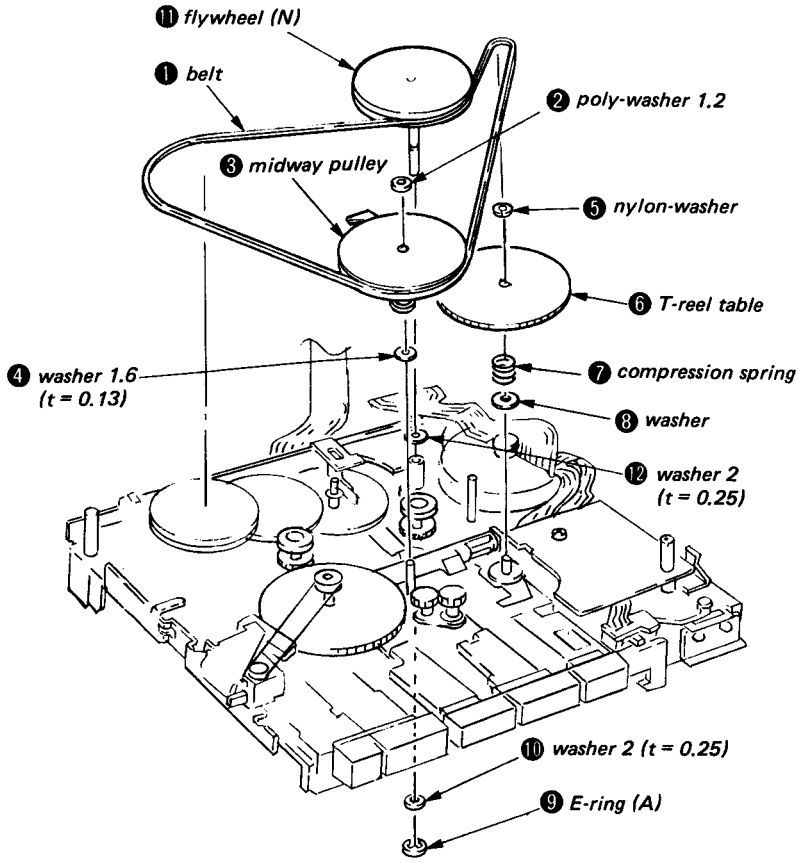
CASSETTE HOLDER



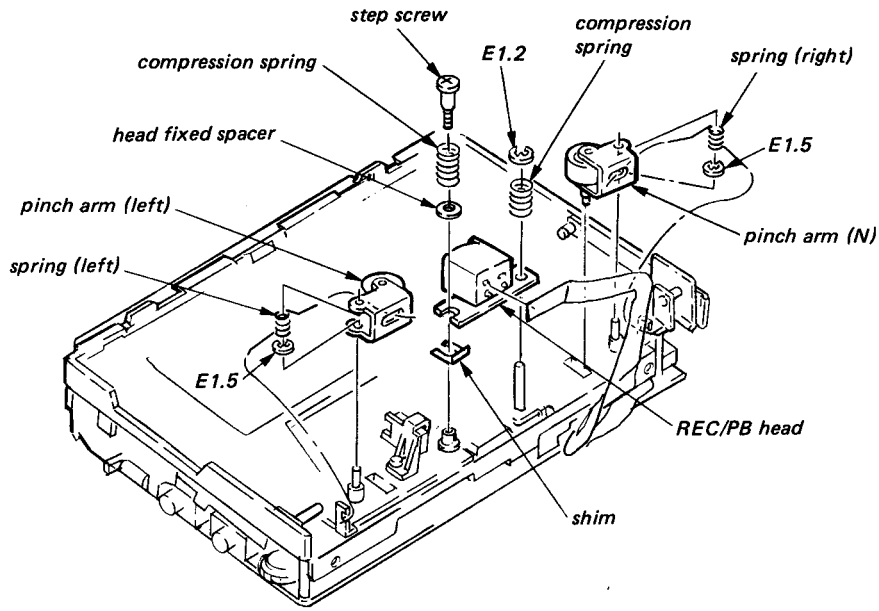
T-REEL TABLE, FLYWHEEL (N)

❶~❽ : T-reel table

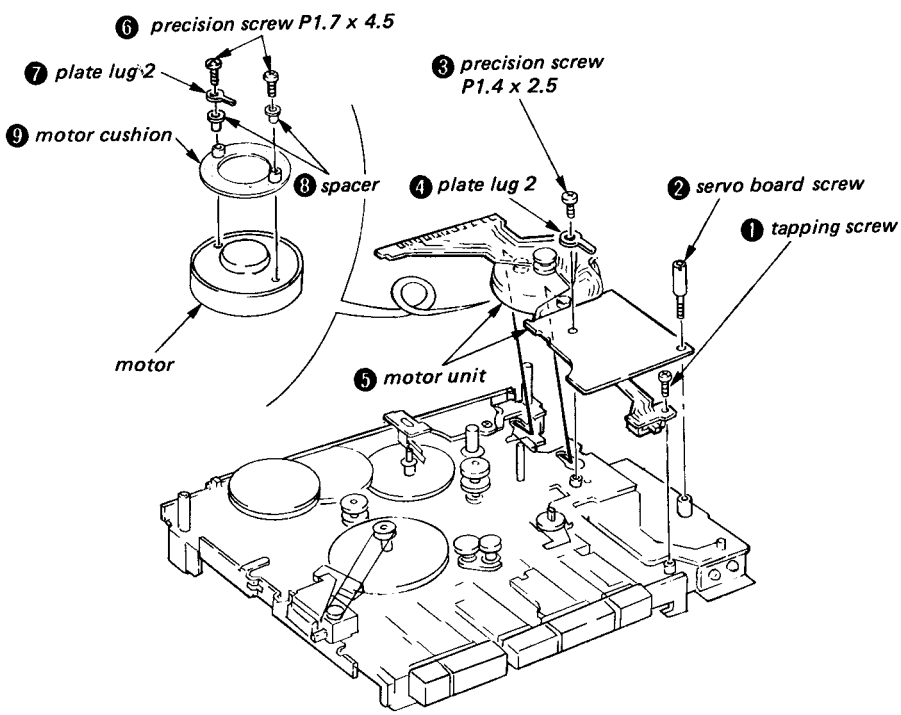
❶, ❾~⓬ : Flywheel (N)



REC/PB HEAD, PINCH ARM



MOTOR



SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

   record/playback head — pinch roller
   erase head — rubber belts
   capstan — idlers

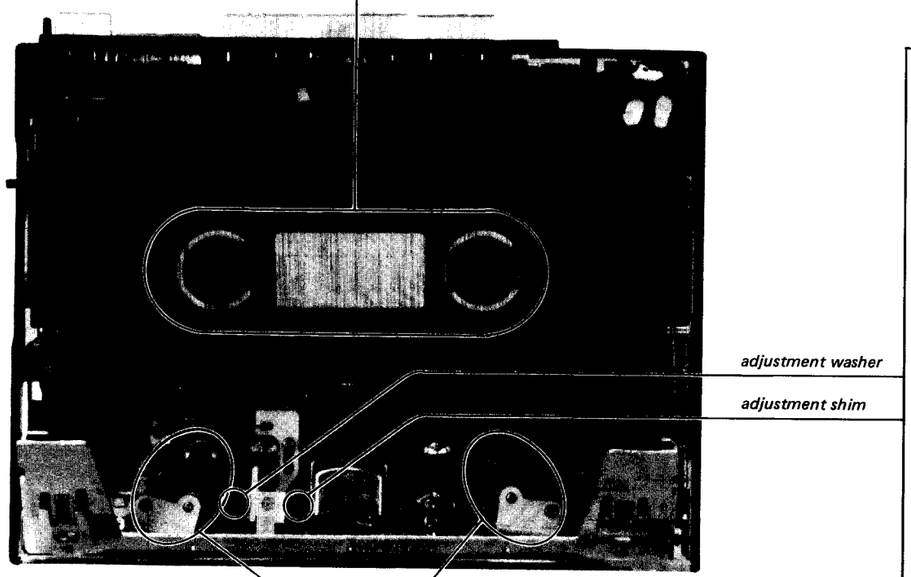
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Mode	Torque meter	Meter reading
FWD	CQ-102C	25 – 45 g·cm (0.35 – 0.62 oz·inch)
FWD Back Tension		2.5 – 4.5 g·cm (0.03 – 0.06 oz·inch)
REV	CQ-102RC	25 – 45 g·cm (0.35 – 0.62 oz·inch)
REV Back Tension		2.5 – 4.5 g·cm (0.03 – 0.06 oz·inch)
FF/CUE	CQ-201B	more than 80 g·cm (1.11 oz·inch)
REW/REVIEW		

Tape Tension

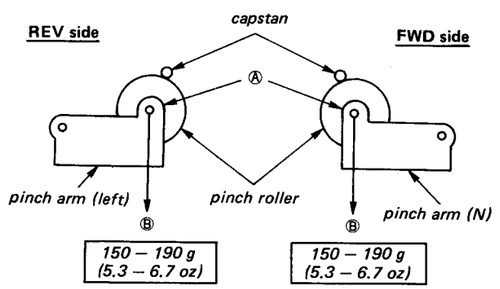
Mode	Tension meter	Meter reading
FWD	CQ-403A	more than 70 g (2.5 oz)
REV	CQ-403R	more than 70 g (2.5 oz)



Pinch Roller Pressure Adjustment

– Playback Mode –

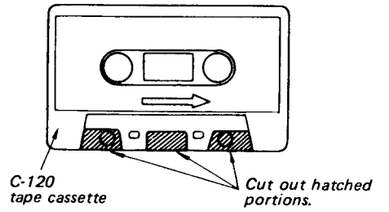
1. Hook the spring scale to the portion shown by the arrow Ⓐ.
2. Detach the pinch roller from the capstan in the direction shown by the arrow Ⓑ.
3. Slowly return the pinch roller and read the spring scale just when the pinch roller starts rotating.



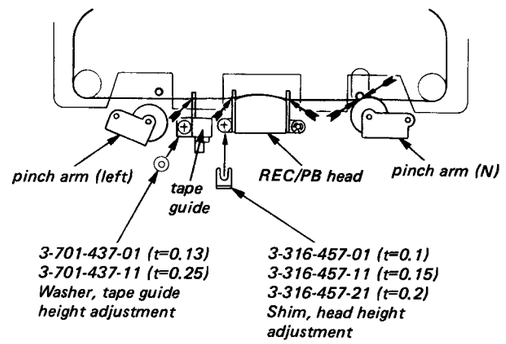
Tape Path Adjustment

Procedure:

1. Prepare an adjustment cassette as shown below.



2. In playback mode and viewing from the front, adjust the head heights to eliminate tape curl and tape twist at arrowed portions.

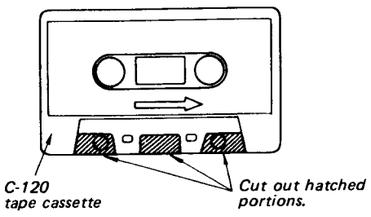


Tension meter	Meter reading
CQ-403A	more than 70 g (2.5 oz)
CQ-403R	more than 70 g (2.5 oz)

Tape Path Adjustment

Procedure:

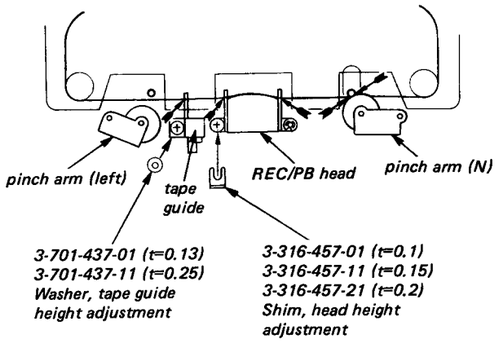
1. Prepare an adjustment cassette as shown below.



adjustment washer

adjustment shim

2. In playback mode and viewing from the front, adjust the head heights to eliminate tape curl and tape twist at arrowed portions.



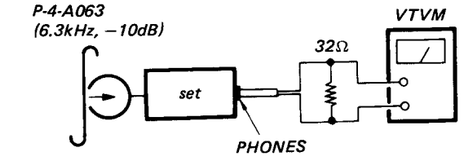
3-2. ELECTRICAL ADJUSTMENTS

REC/PB Head Azimuth Adjustment

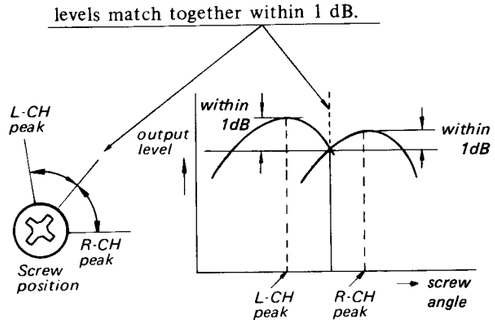
Adjust for both in FWD direction and REV direction.

Procedure:

1. Mode: playback (FWD and REV)

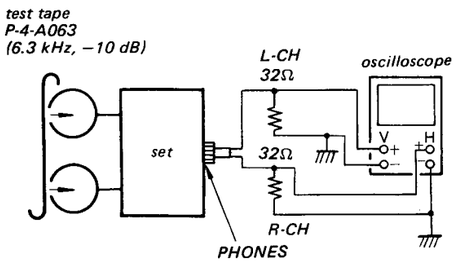


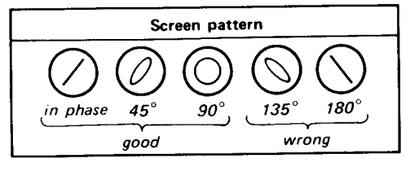
2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw where both of output levels match together within 1 dB.



Note: Finish the screw adjustment with a turn in the clockwise direction. After the adjustment, lock the adjustment screw with suitable locking compound.

3. Phase Check
   Mode: playback





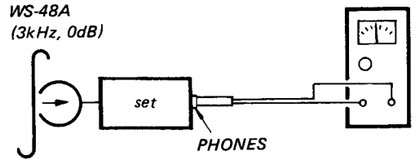
Tape Speed Adjustment

Setting:

VOL control: mechanical mid

Procedure:

Mode: playback

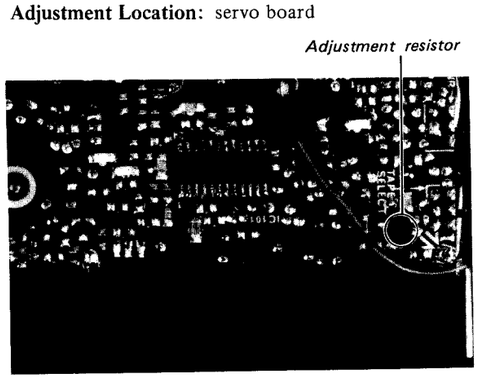


Specification:

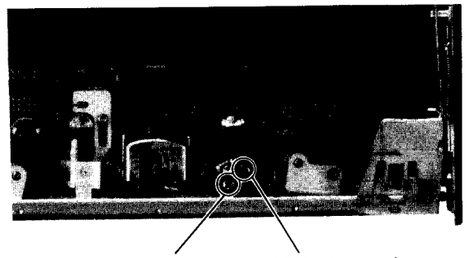
Speed checker	Digital frequency counter
±3%	2,910 to 3,090 Hz

Frequency difference between the beginning and the end of the tape should be within ±2% (±60Hz).

Adjustment Location: servo board



Adjustment Location:



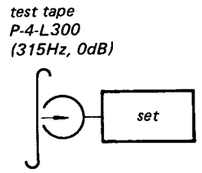
Dolby Level Adjustment

Setting:

PB EQ switch:	NORM
DOLBY NR switch:	OFF
VOL control:	minimum

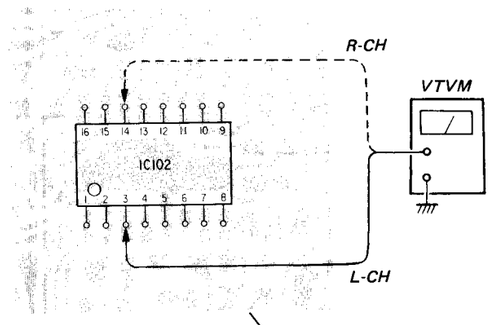
Procedure:

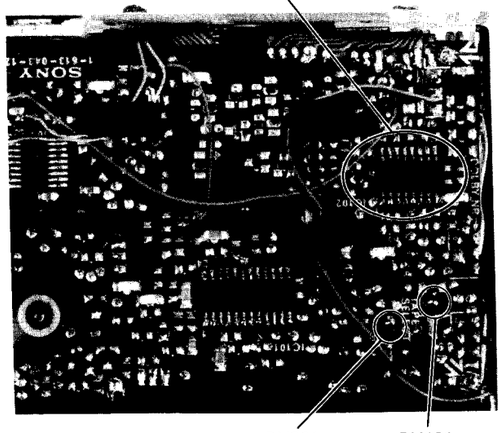
1. Mode: Playback



Adjust RV101 (L-CH) and RV201 (R-CH) for 30 – 34mV (–28.2 to –27.2dB) reading on VTVM.

Adjustment Location: audio board

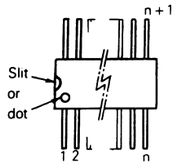




4-1. MOUNTING DIAGRAM
– Conductor Side –

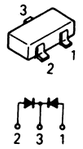
Semiconductor Lead Layouts

CX20023
CX20085
TA7688F

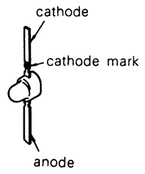


2SA812
2SA1162
2SC1623
2SC2812-L7
DTA114TK
DTC143TK

1S2837

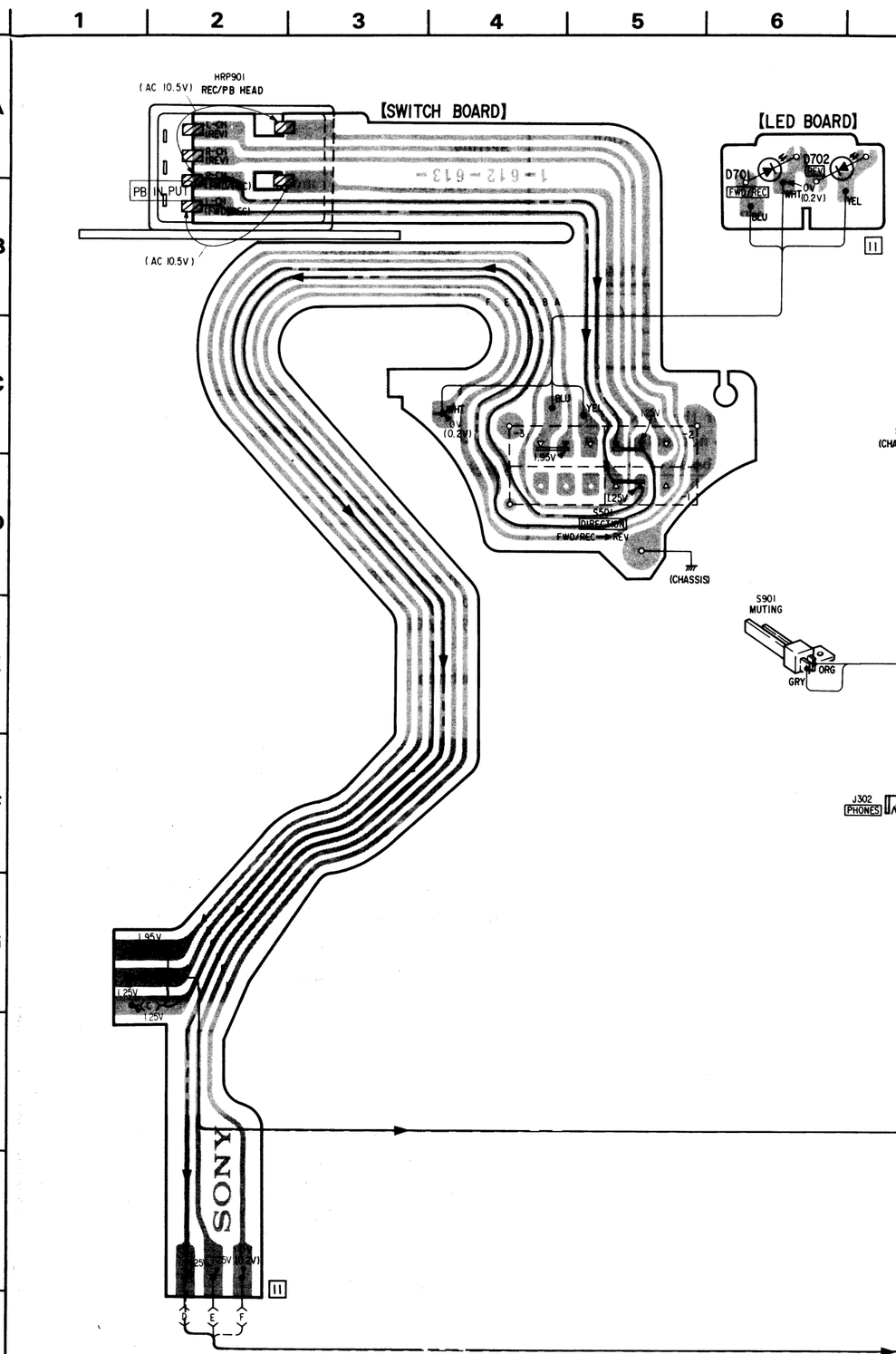


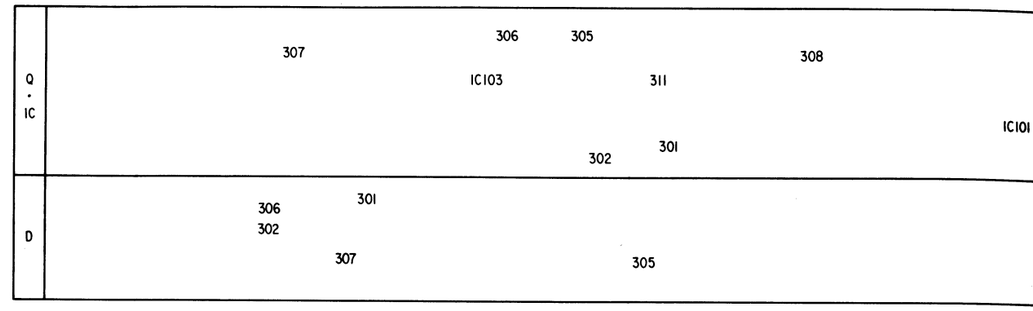
GL-1PR1

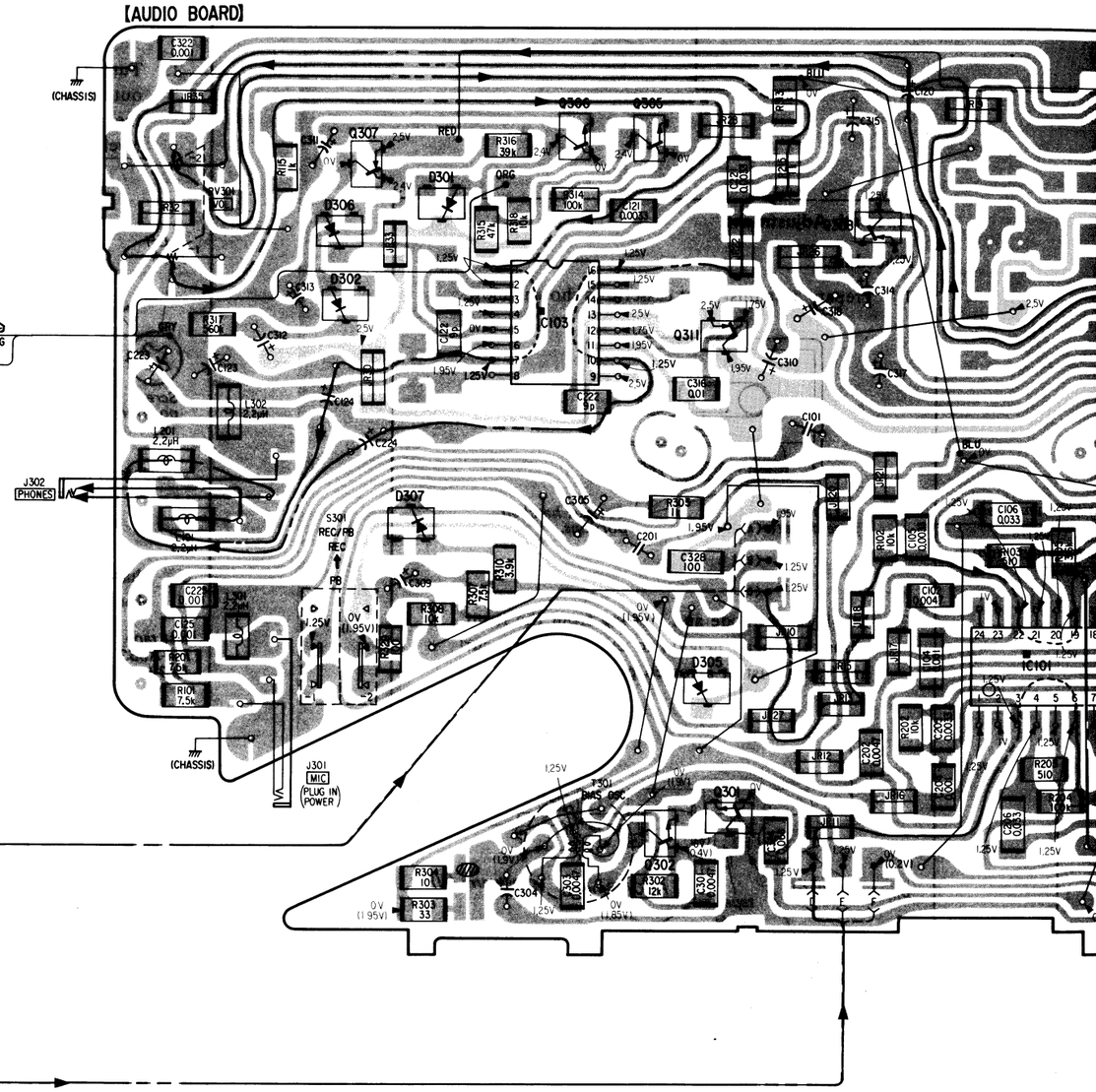


Note:

- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- ——→—— : signal path
- ——·——→ : L-CH signal path
- ——··——→ : R-CH signal path
- ▒▒ : B+ pattern



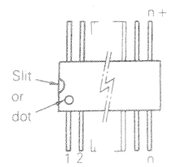




4-1. MOUNTING DIAGRAM
— Conductor Side —

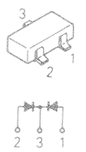
Semiconductor Lead Layouts

CX20023
CX20085
TA7688F

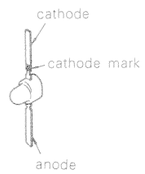


2SA812
2SA1162
2SC1623
2SC2812-L7
DTA114TK
DTC143TK

1S2837

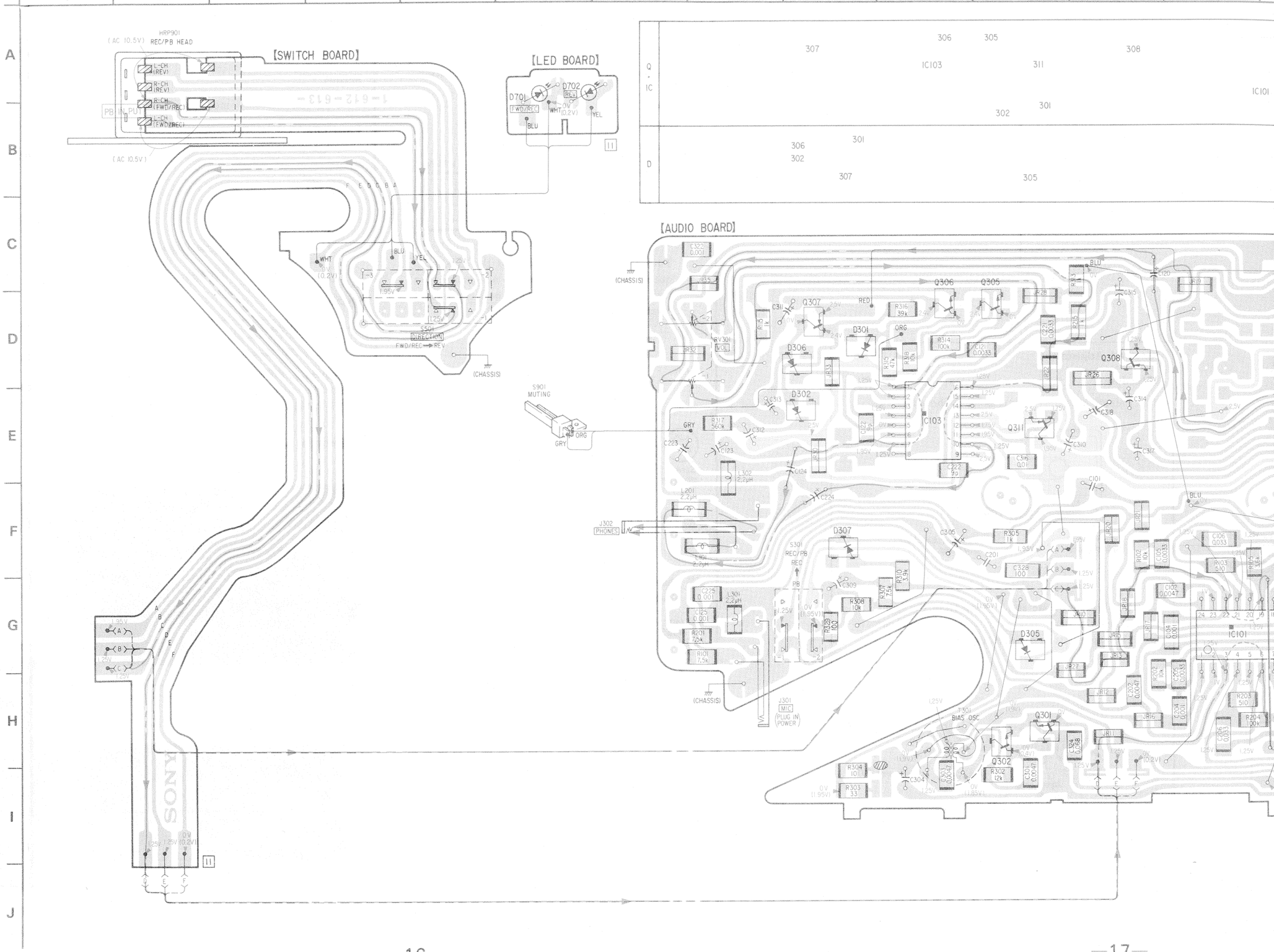


GL-1PR1



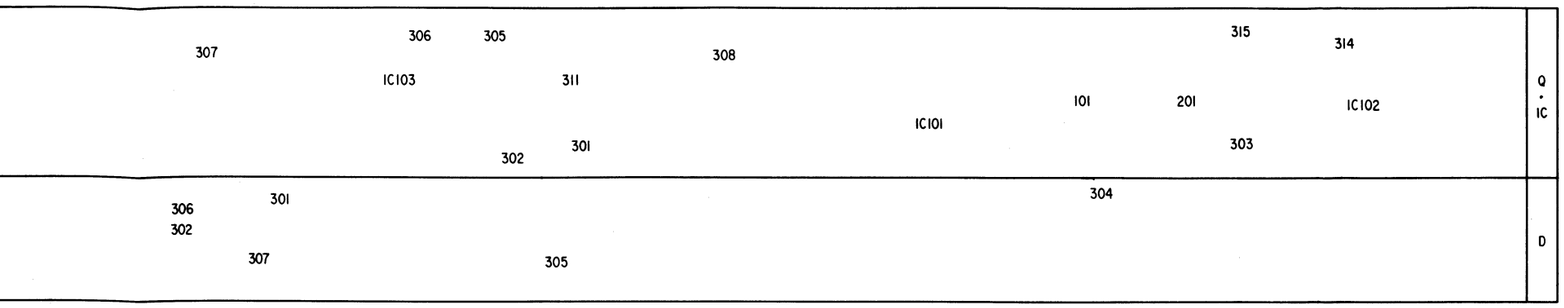
Note:

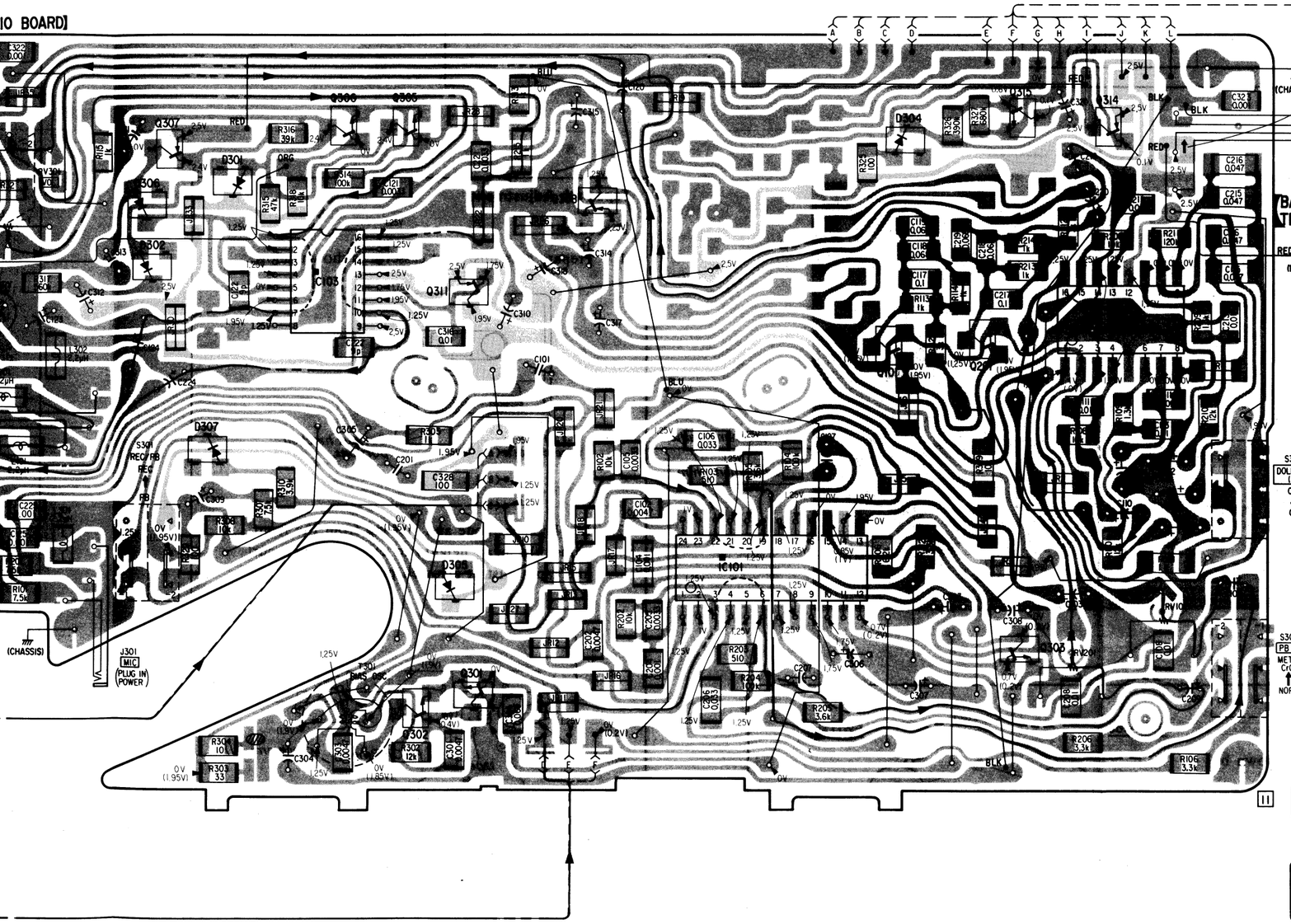
- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- ▬▶▬ : signal path
- ▬▶▬ : L-CH signal path
- ▬▶▬ : R-CH signal path
- ▒▒ : B+ pattern

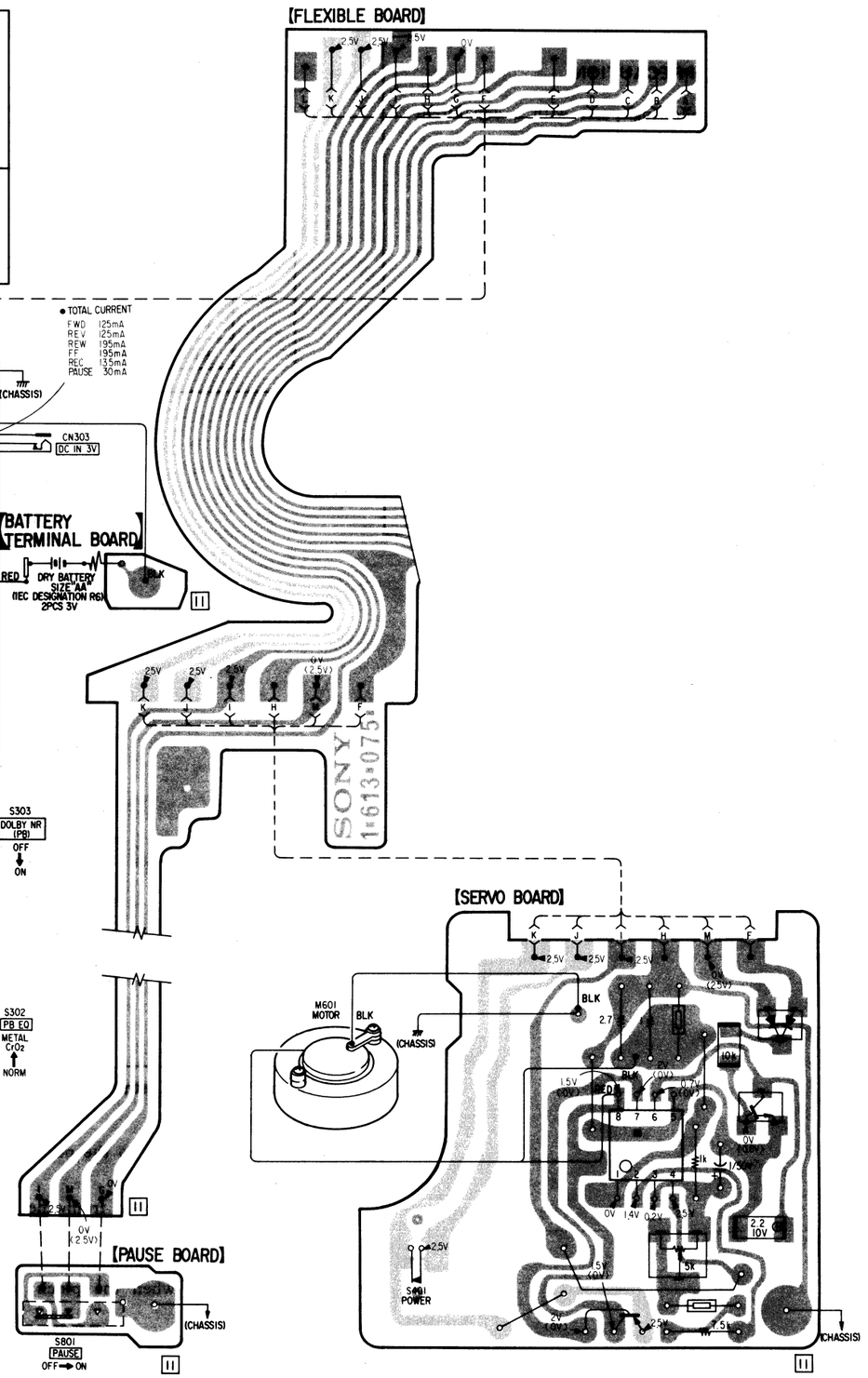


8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

A B C D E F G H I J







8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

A B C D E F G H I J

Q - IC

D

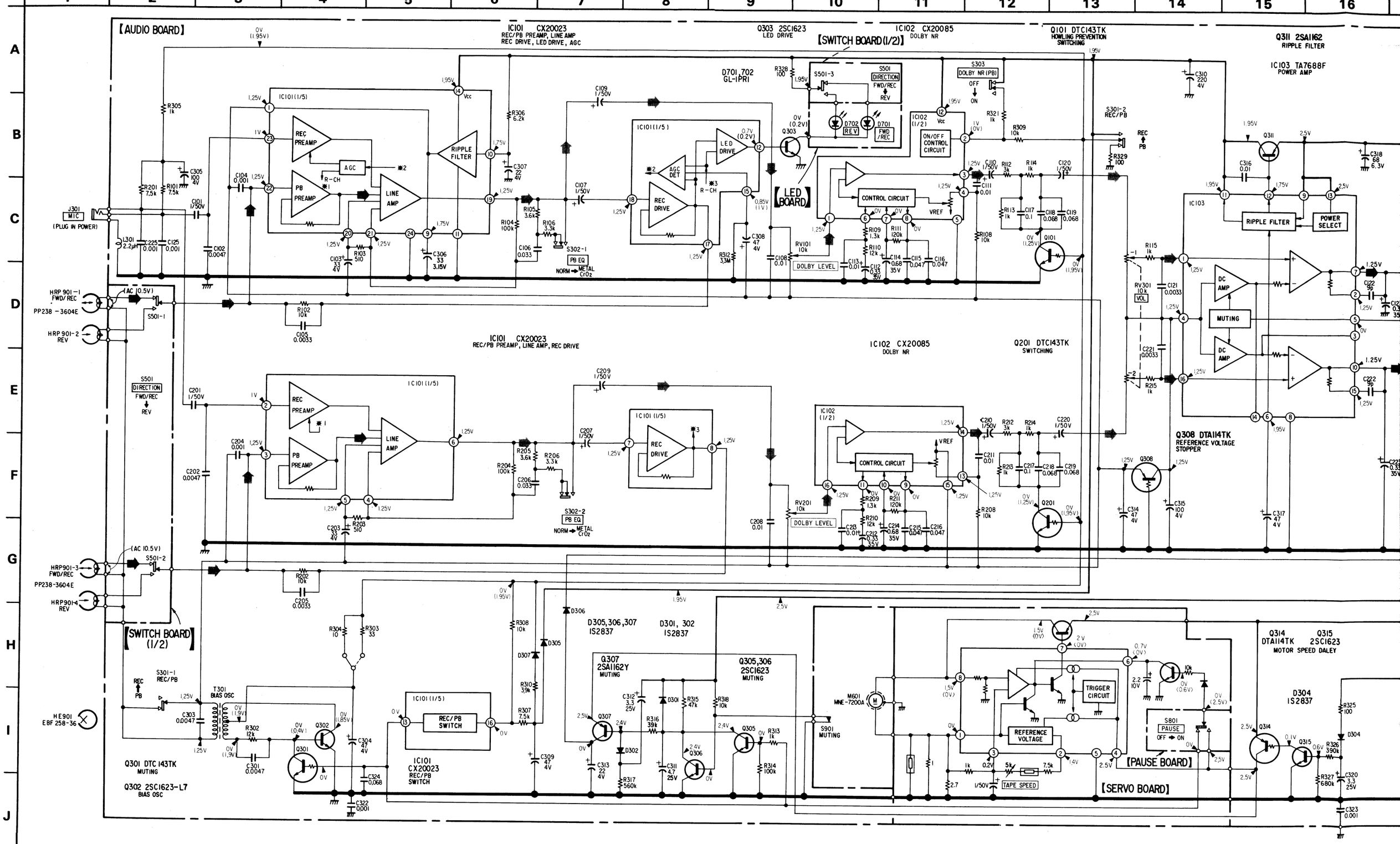
[FLEXIBLE BOARD]

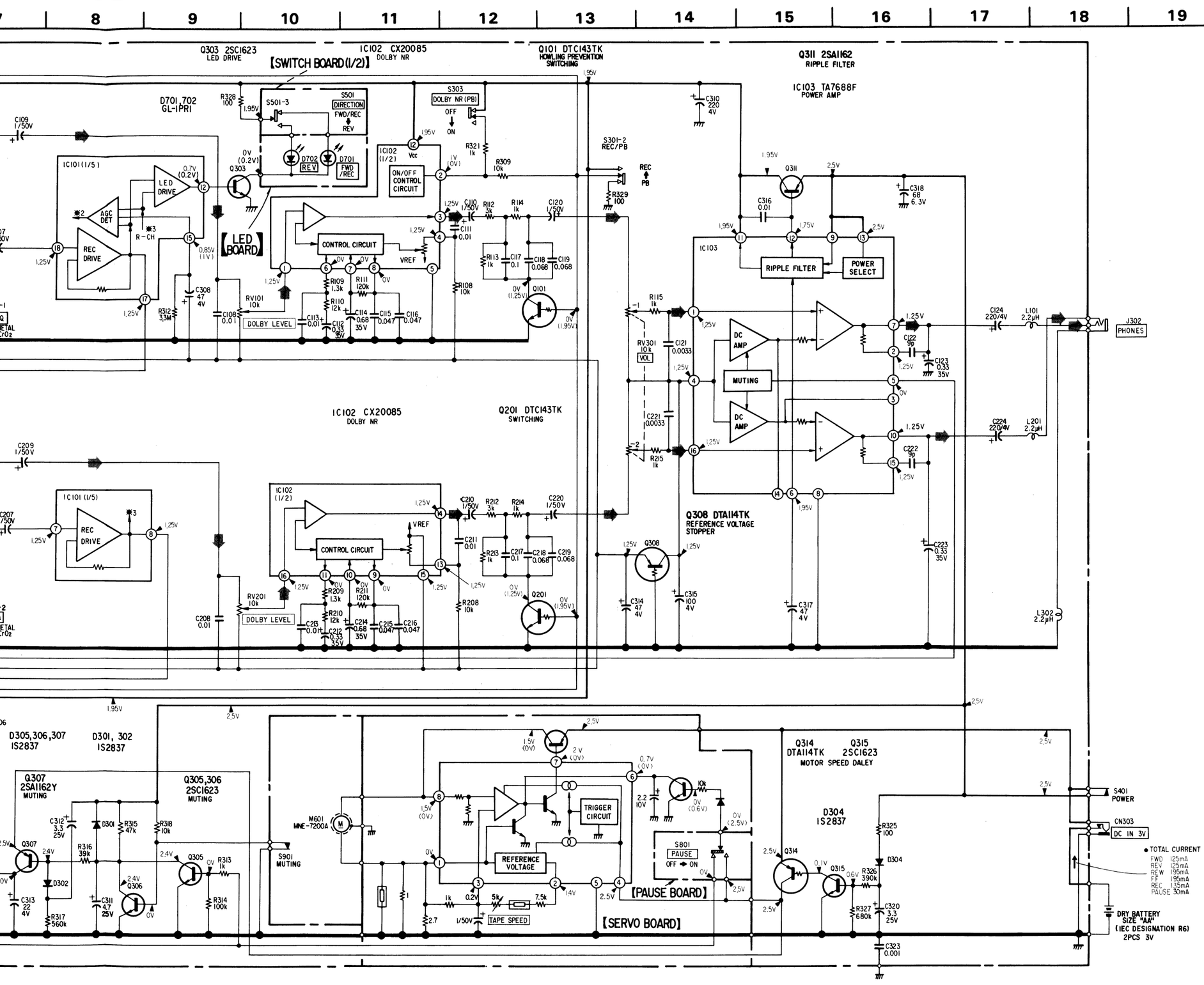
[BATTERY TERMINAL BOARD]

[PAUSE BOARD]

[SERVO BOARD]

4-2. SCHEMATIC DIAGRAM





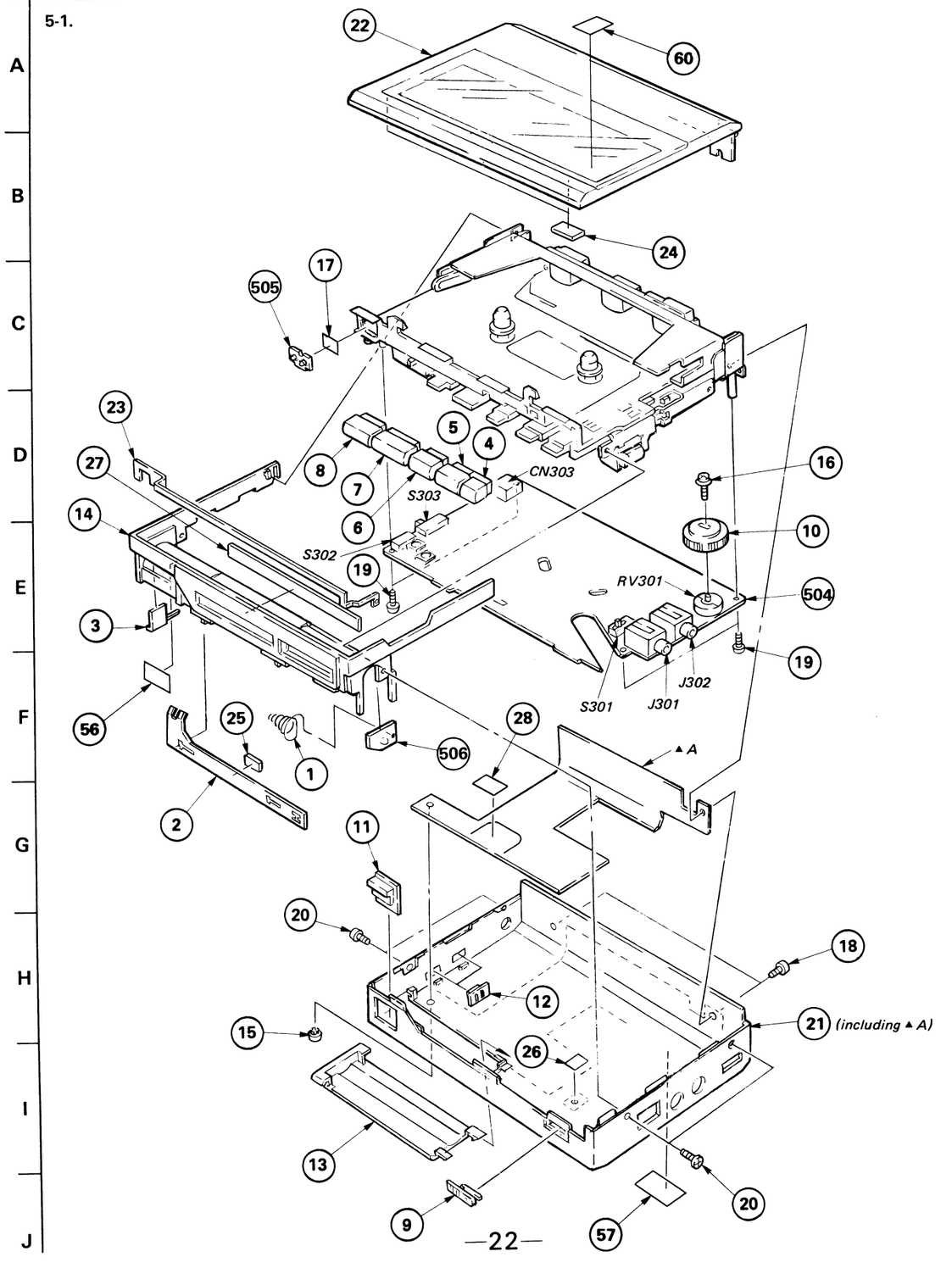
Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- : Signal Path
- Switch with sliding contact indicated by hatched lines shows shorting type.
- : B+ bus.
- : adjustment for repair.
- Total current is measured with no cassette installed.
- AC voltage readings with a auto voltmeter.
- Power voltage is 2.5V and fed with regulated dc power supply from battery terminal.
  Voltages are dc with respect to ground unless otherwise noted.
  Voltage variations may be noted due to normal production tolerances.
  no mark : playback
  ( ) : record
  < > : PAUSE switch ON

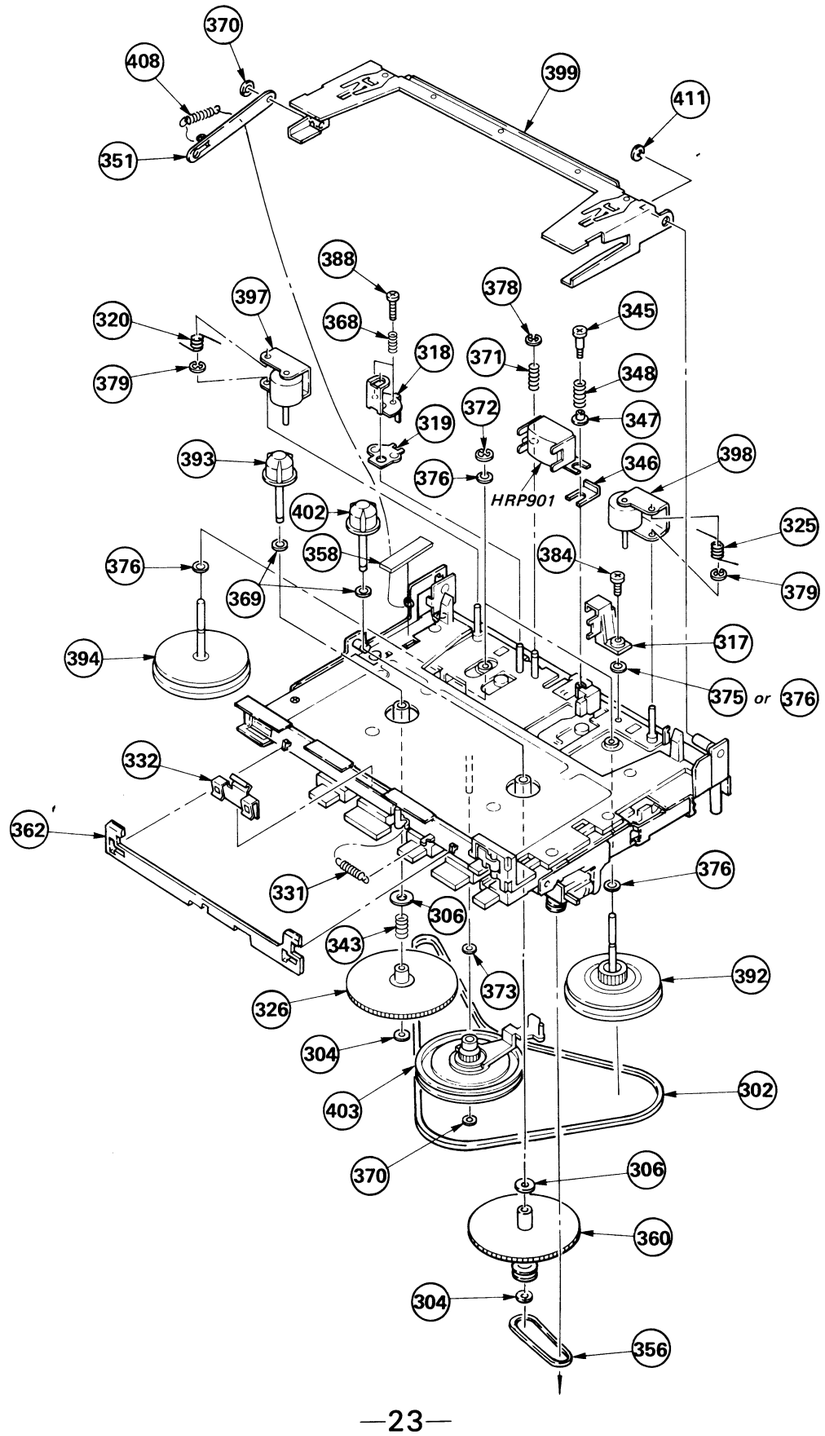
Note: Voltages are measured with a VOM (50kΩ/V).

SECTION 5
EXPLODED VIEWS AND PARTS LIST

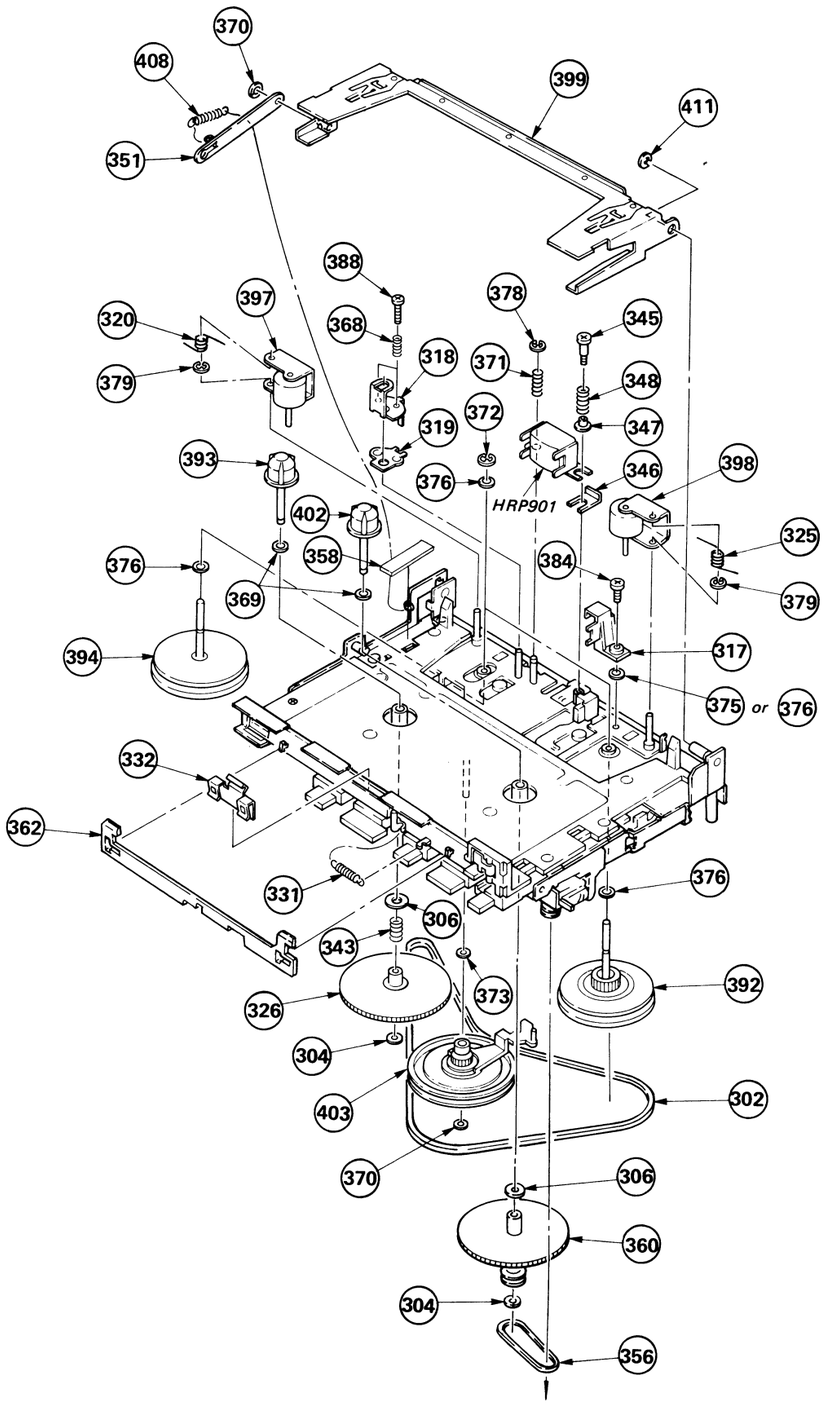
5-1.



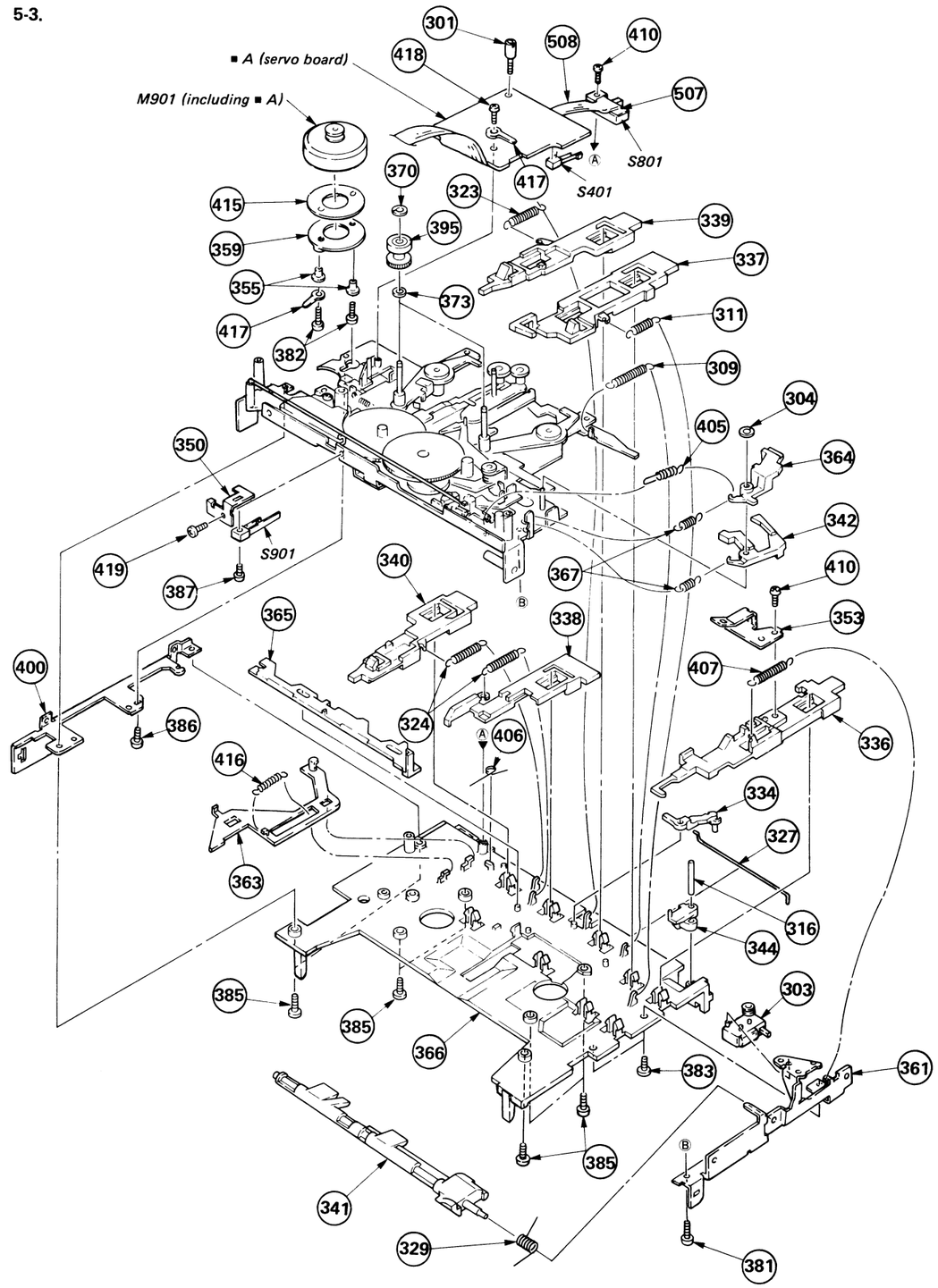
5-2.

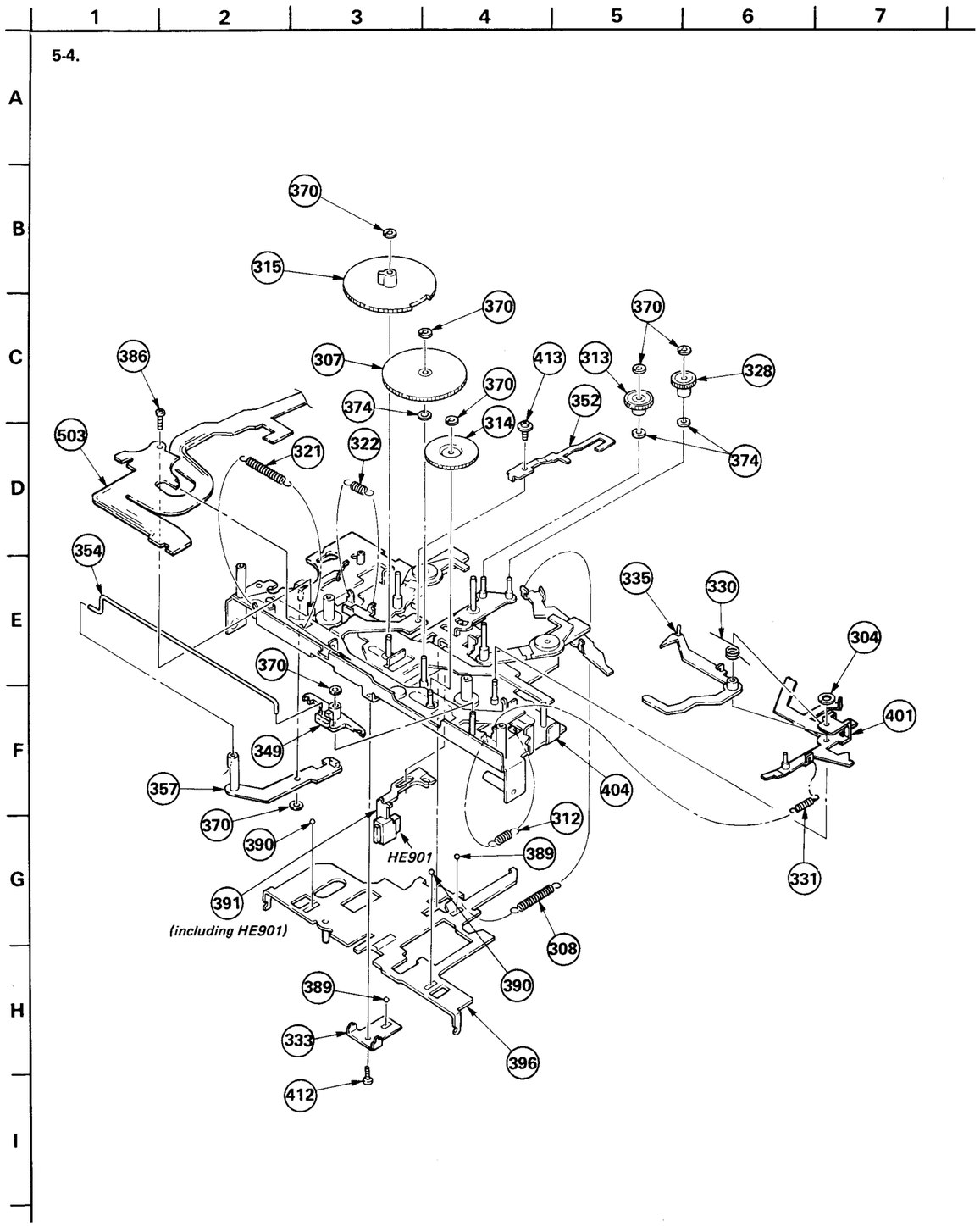


5-2.


370
408
399
411
351
388
397
320
368
378
345
379
318
371
348
372
319
347
393
376
346
398
HRP901
402
325
376
358
384
379
369
394
317
375 or 376
332
362
331
306
376
343
373
392
326
304
403
302
370
306
360
304
356

5-3.


301
508
410
418
■ A (servo board)
507
M901 (including ■ A)
S801
417
S401
370
323
415
395
339
359
337
355
373
311
417
382
309
304
405
350
364
S901
342
419
340
367
387
410
365
338
353
400
407
386
324
406
336
416
334
327
363
316
344
385
303
385
366
383
361
385
341
329
381



GENERAL SECTION

No.	Part No.	Description
1	3-320-873-01	SPRING
2	3-320-802-01	LEVER, PAUSE
3	3-320-803-01	TERMINAL BOARD, PLUG
4	3-320-808-01	BUTTON, REC
5	3-320-809-01	BUTTON, PLAY
6	3-320-810-01	BUTTON, REW
7	3-320-811-01	BUTTON, STOP
8	3-320-812-01	BUTTON, FF
9	3-320-813-01	(WHITE)...KNOB, PAUSE
9	3-320-813-11	(BLACK)...KNOB, PAUSE
10	3-320-814-01	(WHITE)...KNOB, CONTROL, VOL
10	3-320-814-11	(BLACK)...KNOB, CONTROL, VOL
11	3-320-816-01	BUTTON, DIRECTION
12	3-320-817-01	(WHITE)...KNOB, SWITCH, PB EQ, DOLBY NR
12	3-320-817-11	(BLACK)...KNOB, SWITCH, PB EQ, DOLBY NR
13	3-320-819-01	(WHITE)...LID, BATTERY CASE
13	3-320-819-11	(BLACK)...LID, BATTERY CASE
14	3-320-820-01	PANEL, SIDE
15	3-545-657-01	(WHITE)...BUSHING
15	3-545-657-11	(BLACK)...BUSHING
16	3-703-502-11	SCREW
17	3-831-441-XX	CUSHION, CABINET UPPER 10X7 (t=0.5)
18	7-627-553-17	(WHITE)...SCREW, PRECISION +P 2X2
18	7-627-553-18	(BLACK)...SCREW, PRECISION +P 2X2
19	7-627-850-17	SCREW, PRECISION +P 1.4X2.5
20	7-627-850-17	(WHITE)...SCREW, PRECISION +P 1.4X2.5
20	7-627-850-18	(BLACK)...SCREW, PRECISION +P 1.4X2.5
21	X-3320-819-1	(WHITE)...CABINET (REAR) ASSY
21	X-3320-820-1	(BLACK)...CABINET (REAR) ASSY
22	X-3320-817-1	(WHITE)...LID ASSY, CASSETTE
22	X-3320-818-1	(BLACK)...LID ASSY, CASSETTE
23	*3-320-878-01	SHEET, ELECTROSTATIC
24	3-545-659-00	CUSHION, SPEAKER
25	3-570-611-00	SHEET, PROTECTION, LID
26	*3-572-862-00	SPACER
27	9-911-837-XX	CUSHION (t=1)
28	9-911-838-XX	CUSHION, METER (t=0.5)
29	7-627-850-08	SCREW, PRECISION +P 1.4X2

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
51	3-310-961-00	FRAME, INNER
52	3-315-450-00	BELT, CARRYING
53	3-320-856-01	SHEET, PROTECTION, FOR SET
54	3-320-857-01	(Canadian,AEP,UK,E)...INDIVIDUAL CARTON
54	3-320-874-01	(US).....INDIVIDUAL CARTON
55	3-320-883-01	CUSHION
56	3-527-213-00	LABEL, SERIAL NUMBER
57	3-701-624-00	(US,Canadian)...BAG, POLYETHYLENE, FOR INSTRUCTION MANUAL
58	3-703-910-01	(AEP:BLACK)...LABEL, COLOR
58	3-703-923-01	(AEP:WHITE)...LABEL, COLOR
59	3-773-922-11	(UK,E).....MANUAL, INSTRUCTION
59	3-773-922-21	(US).....MANUAL, INSTRUCTION
59	3-773-922-31	(Canadian)...MANUAL, INSTRUCTION
59	3-773-922-41	(AEP).....MANUAL, INSTRUCTION
60	3-795-748-21	(US)...SAFETY INSTRUCTIONS, HEADPHONE
61	8-951-089-90	DR-W70L SET
62	X-3320-811-1	CASE ASSY, CARRYING

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in µF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:µF, PF:µµF.

COILS

- MMH : mH, UH : µH

SEMICONDUCTORS

In each case, U : µ, for example:
UA···: µA···, UPA···: µPA···,
UPC···: µPC,
UPD···: µPD···

MECHANISM SECTION

No.	Part No.	Description
301	3-320-866-01	SCREW, SERVO PC BOARD
302	3-320-872-01	BELT
303	1-548-582-11	COUNTER, TAPE (SMALL TYPE)
304	3-307-948-01	WASHER, NYLON
305	.....	
306	3-316-308-00	WASHER
307	3-316-313-00	GEAR (T)
308	3-316-316-00	SPRING, TENSION
309	3-316-318-00	SPRING, TENSION
310	.....	
311	3-316-320-00	SPRING, TENSION
312	3-316-324-00	SPRING, TENSION
313	3-316-325-00	GEAR (A), FWD
314	3-316-329-00	GEAR, DETECTION
315	3-316-334-00	GEAR, REVERSE
316	3-316-340-00	PIN, PARALLEL
317	3-316-341-00	GUIDE, TAPE
318	3-316-342-00	ARM, AZIMUTH
319	3-316-343-00	RETAINER, AZIMUTH
320	3-316-359-00	SPRING (RIGHT)
321	3-316-360-00	SPRING, TENSION
322	3-316-361-01	SPRING, TENSION
323	3-316-362-00	SPRING, TENSION
324	3-316-363-00	SPRING, TENSION
325	3-316-364-00	SPRING (LEFT)
326	3-316-373-00	TABLE, REEL, T
327	3-316-376-00	LINK, MISTAKE ERASING
328	3-316-379-00	GEAR (B), FWD
329	3-316-382-00	SPRING
330	3-316-383-00	SPRING
331	3-316-385-00	SPRING, TENSION
332	3-316-386-00	SPRING
333	3-316-389-00	REATAINER (A), PC BOARD
334	3-316-393-00	PLATE, EJECT
335	*3-316-396-00	ARM (A), TRIGGER
336	3-316-401-00	LEVER, REC
337	3-316-406-00	LEVER, FWD
338	3-316-407-00	LEVER, STOP
339	3-316-408-00	LEVER, REW
340	3-316-409-00	LEVER, FF
341	3-316-410-00	PLATE, LOCK
342	3-316-449-00	PLATE, LOCK, REVERSE
343	3-316-452-00	SPRING, COMPRESSION
344	3-316-453-22	CLAW, PREVENTION
345	3-316-456-00	SCREW, STEP

MECHANISM SECTION

No.	Part No.	Description
346	3-316-457-01	SHIM (t=0.1)
346	3-316-457-11	SHIM (t=0.15)
346	3-316-457-21	SHIM (t=0.2)
347	3-316-495-01	SPACER, HEAD FIXED
348	3-318-106-01	SPRING (H), COMPRESSION
349	3-318-114-01	ARM, LOCK
350	3-318-117-01	BRACKET, LEAF SWITCH
351	3-320-801-01	ARM, HOLDER
352	3-320-824-01	SPRING
353	3-320-861-01	SPRING
354	*3-320-827-01	JOINT
355	3-320-838-01	SPACER
356	3-320-841-01	BELT (COUNTER)
357	3-320-842-01	ARM, JOINT
358	3-320-887-01	SHEET, ORNAMENTAL
359	3-320-844-01	CUSHION, MOTOR
360	3-320-845-01	TABLE, REEL, S
361	3-320-847-01	BRACKET, COUNTER
362	3-320-849-01	SLIDER, LOCK
363	3-320-850-01	LEVER, DIRECTION
364	3-320-851-01	LEVER, REC RELEASE
365	3-320-852-01	LEVER, SWITCH
366	X-3320-812-1	CHASSIS ASSY, MOLD
367	3-547-664-00	SPRING, TENSION
368	3-563-463-00	SPRING, COMPRESSION
369	3-570-129-00	WASHER (F)
370	3-570-615-00	POLY-WASHER (DIA.1.2)
371	3-579-759-00	SPRING, COMPRESSION
372	3-590-768-00	RING (A), E
373	3-701-436-01	WASHER, 1.6 (t=0.13)
374	3-701-436-11	WASHER, 1.6 (t=0.25)
375	3-701-437-01	WASHER 2 (t=0.13)
376	3-701-437-11	WASHER 2 (t=0.25)
377	.....	
378	7-624-101-04	STOP RING 1.2 (E TYPE)
379	7-624-102-04	STOP RING 1.5, TYPE -E
380	.....	
381	.....	
382	7-627-552-67	SCREW, PRECISION +P 1.7X4.5
383	7-627-553-18	SCREW, PRECISION +P 2X2
384	7-627-553-38	SCREW, PRECISION +P 2X3
385	7-627-554-18	+P 2X3.5
386	7-627-850-07	SCREW, PRECISION +P 1.4X2
387	7-627-850-27	SCREW, PRECISION +P 1.4X3
388	7-627-850-67	SCREW, PRECISION +P 1.4X4
389	7-671-111-01	STEEL BALL 1MM
390	7-671-111-11	STEEL, BALL 1.5MM

MECHANISM SECTION

No.	Part No.	Description
391	A-3114-032-A	HOLDER ASSY, EBF
392	X-3316-301-0	FLYWHEEL (R) ASSY
393	X-3316-303-0	CLAW (TAKE-UP) ASSY, REEL
394	X-3320-814-1	FLYWHEEL (N) ASSY
395	X-3316-310-0	GEAR ASSY, FR
396	X-3316-313-0	CHASSIS ASSY, HEAD
397	X-3320-813-1	ARM (N) ASSY, PINCH
398	X-3316-316-0	PINCH ARM (LEFT) ASSY
399	X-3320-804-1	HOLDER ASSY, CASSETTE
400	X-3320-805-1	BRACKET ASSY, TOGGLE
401	X-3320-807-1	ARM (C) ASSY, DETECTION
402	X-3320-808-1	CLAW (S) ASSY, REEL
403	X-3320-809-1	PULLEY ASSY, MIDWAY
404	X-3320-810-1	CHASSIS ASSY
405	3-318-131-01	SPRING, TENSION
406	3-320-860-01	SPRING
407	3-320-862-01	SPRING, TENSION
408	3-437-026-00	SPRING, TENSION
409	3-849-226-00	CLOTH, UNWEAVED (25X6X0.5)
410	3-320-888-01	SCREW, TAPPING
411	7-624-104-04	STOP RING 2.0, TYPE -E
412	7-627-551-47	SCREW, PRECISION +P 1.4X1.4
413	7-627-850-37	SCREW, PRECISION +P 1.4X1.4
414	.....	
415	*3-320-865-01	PLATE, SHIELD, MOTOR
416	3-564-737-00	SPRING, TENSION
417	7-623-505-01	LUG, PLATE, DIA. 2
418	7-627-850-17	SCREW, PRECISION +P 1.4X2.5
419	7-627-551-07	SCREW, PRECISION +P 1.4X1.6

ELECTRICAL PARTS

Ref.No.	Part No.	Description		
501	*1-535-511-11	FRAME, LEAD (F TYPE)		
502	.....			
503	1-612-613-11	PC BOARD, SWITCH FLEXIBLE		
504	*A-3015-292-A	PC BOARD ASSY, AUDIO		
505	*1-613-044-11	PC BOARD, LED		
506	*1-613-045-11	PC BOARD, BATTERY TERMINAL		
507	*1-613-046-11	PC BOARD, PAUSE		
508	1-613-075-11	PC BOARD, TERMINAL FLEXIBLE		
C101	1-124-499-11	ELECT(NONPOLAR) 1MF	20%	50V
C102	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C103	1-124-431-00	ELECT 33MF	20%	4V
C104	1-163-047-00	CERAMIC CHIP 0.001MF	10%	50V
C105	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C106	1-163-074-00	CERAMIC CHIP 0.033MF		50V
C107	1-124-438-00	ELECT 1MF	20%	50V
C108	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C109	1-124-438-00	ELECT 1MF	20%	50V
C110	1-124-438-00	ELECT 1MF	20%	50V
C111	1-163-021-00	CERAMIC CHIP 0.01MF	5%	50V
C112	1-131-344-00	TANTALUM 0.33MF	10%	35V
C113	1-163-021-00	CERAMIC CHIP 0.01MF	5%	50V
C114	1-131-346-00	TANTALUM 0.68MF	10%	35V
C115	1-163-075-00	CERAMIC CHIP 0.047MF		50V
C116	1-163-075-00	CERAMIC CHIP 0.047MF		50V
C117	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C118	1-163-833-00	CERAMIC CHIP 0.068MF		25V
C119	1-163-833-00	CERAMIC CHIP 0.068MF		25V
C120	1-124-438-00	ELECT 1MF	20%	50V
C121	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C122	1-163-092-91	CERAMIC CHIP 9PF	0.25PF	50V
C123	1-131-344-00	TANTALUM 0.33MF	10%	35V
C124	1-124-434-00	ELECT 220MF	20%	4V
C125	1-163-141-00	CERAMIC CHIP 0.001MF		50V
C301	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C303	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C304	1-124-432-00	ELECT 47MF	20%	4V
C305	1-124-433-00	ELECT 100MF	20%	4V
C306	1-131-392-00	TANTALUM 33MF	20%	3.15V
C307	1-124-430-00	ELECT 22MF	20%	4V
C308	1-124-432-00	ELECT 47MF	20%	4V
C309	1-124-432-00	ELECT 47MF	20%	4V
C310	1-124-434-00	ELECT 220MF	20%	4V
C311	1-124-461-11	ELECT 4.7MF	20%	16V
C312	1-124-436-00	ELECT 3.3MF	20%	25V

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- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···,
UPC···: μPC,
UPD···: μPD···

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ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C313	1-124-430-00	ELECT	22MF	20%	4V
C314	1-124-432-00	ELECT	47MF	20%	4V
C315	1-124-433-00	ELECT	100MF	20%	4V
C316	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C317	1-124-432-00	ELECT	47MF	20%	4V
C318	1-131-388-00	TANTALUM	68MF	20%	6.3V
C320	1-124-436-00	ELECT	3.3MF	20%	25V
C322	1-163-141-00	CERAMIC CHIP	0.001MF		50V
C323	1-163-141-00	CERAMIC CHIP	0.001MF		50V
C324	1-163-833-00	CERAMIC CHIP	0.068MF		25V
CN303	1-507-951-11	JACK, EXTERNAL POWER (DC IN 3V)			
D301	8-719-100-05	DIODE 1S2837			
D302	8-719-100-05	DIODE 1S2837			
D304	8-719-100-05	DIODE 1S2837			
D305	8-719-100-05	DIODE 1S2837			
D306	8-719-100-05	DIODE 1S2837			
D307	8-719-100-05	DIODE 1S2837			
D701	8-719-912-24	DIODE GL-1PR1			
D702	8-719-912-24	DIODE GL-1PR1			
HE901	SUPPLIED WITH NO.391.				
HRP901	8-825-537-10	HEAD, PEC/PB (PP-238-3604E)			
IC101	8-759-907-36	IC CX20023			
IC102	8-759-908-08	IC CX20085			
IC103	8-759-200-95	IC TA7688F			
J301	1-507-929-31	JACK (MIC)			
J302	1-507-929-11	JACK (PHONES)			
JR1	1-216-296-00	METAL CHIP	0	5%	1/8W
JR2	1-216-296-00	METAL CHIP	0	5%	1/8W
JR3	1-216-295-00	METAL CHIP	0	5%	1/10W
JR4	1-216-295-00	METAL CHIP	0	5%	1/10W
JR5	1-216-295-00	METAL CHIP	0	5%	1/10W
JR6	1-216-296-00	METAL CHIP	0	5%	1/8W
JR10	1-216-296-00	METAL CHIP	0	5%	1/8W
JR11	1-216-295-00	METAL CHIP	0	5%	1/10W
JR12	1-216-295-00	METAL CHIP	0	5%	1/10W
JR13	1-216-295-00	METAL CHIP	0	5%	1/10W
JR15	1-216-296-00	METAL CHIP	0	5%	1/8W
JR16	1-216-295-00	METAL CHIP	0	5%	1/10W
JR17	1-216-295-00	METAL CHIP	0	5%	1/10W
JR18	1-216-295-00	METAL CHIP	0	5%	1/10W
JR19	1-216-296-00	METAL CHIP	0	5%	1/8W
JR20	1-216-295-00	METAL CHIP	0	5%	1/10W
JR21	1-216-295-00	METAL CHIP	0	5%	1/10W
JR22	1-216-296-00	METAL CHIP	0	5%	1/8W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
JR26	1-216-296-00	METAL CHIP	0	5%	1/8W
JR27	1-216-295-00	METAL CHIP	0	5%	1/10W
JR28	1-216-296-00	METAL CHIP	0	5%	1/8W
JR30	1-216-296-00	METAL CHIP	0	5%	1/8W
JR32	1-216-296-00	METAL CHIP	0	5%	1/8W
JR33	1-216-295-00	METAL CHIP	0	5%	1/10W
JR35	1-216-295-00	METAL CHIP	0	5%	1/10W
L101	1-410-123-21	INDUCTOR CHIP	2.2UH		
L201	1-410-123-21	INDUCTOR CHIP	2.2UH		
L301	1-410-123-21	INDUCTOR CHIP	2.2UH		
L302	1-410-123-21	INDUCTOR CHIP	2.2UH		
M901	8-835-116-01	MOTOR, DC (MNE-7200A)			
Q101	8-729-900-98	TRANSISTOR DTC143TK			
Q201	8-729-900-98	TRANSISTOR DTC143TK			
Q301	8-729-900-98	TRANSISTOR DTC143TK			
Q302	8-729-881-23	TRANSISTOR 2SC2812-L7			
Q303	8-729-100-66	TRANSISTOR 2SC1623			
Q305	8-729-100-66	TRANSISTOR 2SC1623			
Q306	8-729-100-66	TRANSISTOR 2SC1623			
Q307	8-729-100-76	TRANSISTOR 2SA812			
Q308	8-729-900-51	TRANSISTOR DTA114TK			
Q311	8-729-216-22	TRANSISTOR 2SA1162			
Q314	8-729-900-51	TRANSISTOR DTA114TK			
Q315	8-729-100-66	TRANSISTOR 2SC1623			
R101	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R102	1-216-073-00	METAL CHIP	10K	5%	1/10W
R103	1-216-042-00	METAL CHIP	510	5%	1/10W
R104	1-216-097-00	METAL CHIP	100K	5%	1/10W
R105	1-216-062-00	METAL CHIP	3.6K	5%	1/10W
R106	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R108	1-216-073-00	METAL CHIP	10K	5%	1/10W
R109	1-216-052-00	METAL CHIP	1.3K	5%	1/10W
R110	1-216-075-00	METAL CHIP	12K	5%	1/10W
R111	1-216-099-00	METAL CHIP	120K	5%	1/10W
R112	1-216-060-00	METAL CHIP	3K	5%	1/10W
R113	1-216-049-00	METAL CHIP	1K	5%	1/10W
R114	1-216-049-00	METAL CHIP	1K	5%	1/10W
R115	1-216-049-00	METAL CHIP	1K	5%	1/10W
R302	1-216-075-00	METAL CHIP	12K	5%	1/10W
R303	1-216-013-00	METAL CHIP	33	5%	1/10W
R304	1-216-001-00	METAL CHIP	10	5%	1/10W
R305	1-216-049-00	METAL CHIP	1K	5%	1/10W
R306	1-216-068-00	METAL CHIP	6.2K	5%	1/10W
R307	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R308	1-216-073-00	METAL CHIP	10K	5%	1/10W

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ELECTRICAL PARTS

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R309	1-216-222-00	METAL CHIP	10K	5%	1/8W
R310	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R312	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R313	1-216-049-00	METAL CHIP	1K	5%	1/10W
R314	1-216-097-00	METAL CHIP	100K	5%	1/10W
R315	1-216-089-00	METAL CHIP	47K	5%	1/10W
R316	1-216-087-00	METAL CHIP	39K	5%	1/10W
R317	1-216-115-00	METAL CHIP	560K	5%	1/10W
R318	1-216-073-00	METAL CHIP	10K	5%	1/10W
R321	1-216-198-00	METAL CHIP	1K	5%	1/8W
R325	1-216-025-00	METAL CHIP	100	5%	1/10W
R326	1-216-111-00	METAL CHIP	390K	5%	1/10W
R327	1-216-117-00	METAL CHIP	680K	5%	1/10W
R329	1-216-025-00	METAL CHIP	100	5%	1/10W
R701	1-216-025-00	METAL CHIP	100	5%	1/10W
RV101	1-230-242-00	RES, ADJ, CARBON 10K			
RV201	1-230-242-00	RES, ADJ, CARBON 10K			
RV301	1-230-165-00	RES, VAR, CARBON 10K/10K (VOL)			
S301	1-554-910-11	SWITCH, SLIDE (REC/PB)			
S302	1-554-667-00	SWITCH, SLIDE (PB EQ)			
S303	1-554-667-00	SWITCH, SLIDE (DOLBY NR)			
S401	1-554-911-11	SWITCH, LEAF (POWER)			
S501	1-554-647-00	SWITCH, SLIDE (DIRECTION)			
S801	1-554-912-11	SWITCH, SLIDE (PAUSE)			
S901	1-553-226-21	SWITCH, LEAF (MUTING)			
T301	1-433-249-00	TRANSFORMER, BIAS OSCILLATOR			

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